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.41 Lands

Overlays:

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Narrative:

Introduction

Clark County encompasses an area of 5,075,009 acres and is the sixth largest county in the state of Nevada. Clark County is the most populated county in Nevada, and 61 percent of the land in the county is publicly owned and administered by the BLM. Table .41-1 summarizes land ownership in the county. For a more detailed breakdown by agency in each planning unit and for the entire county, see Table .41-2.

TABLE .41-1
LAND OWNERSHIP SUMMARY IN CLARK COUNTY

<u>Ownership</u>	<u>Acres</u>
Public Land (BLM Administered)	3,097,131
Other Federal Lands	1,565,830
Subtotal	4,662,961
Non-Federal Lands	412,048
Total Ownership	5,075,009

Clark County is predominantly rural in nature, with the exception of the Las Vegas Valley urban area. The Stateline Planning Unit basically comprises the western and southern portions of the county, including the Las Vegas Valley. The Virgin Valley Planning Unit comprises the remainder and northeastern portion of Clark County.

In addition to the Las Vegas Valley area, a number of small rural communities are located throughout the county. These communities are discussed in the appropriate section covering the planning unit within which they are located.

The Las Vegas Valley consists of the cities of Henderson, Las Vegas, North Las Vegas, and the unincorporated areas surrounding those municipalities. The Valley is unique in that it represents a fast-growing metropolitan area compared to the relatively rural atmosphere found in the remainder of the county. The characteristics and problems associated with this urban environment are not applicable to other areas of Clark County. Although the Las Vegas Valley lies geographically within the Stateline Planning Unit, it will be treated as a "sub-unit" in the following discussion because it warrants separate consideration to satisfactorily describe this urban metropolitan area and the associated management problems.

Lands Inventory

The lands inventory for Clark County was designed to provide current data on land ownership and administration in the county in the following categories:

- Total acreage in Clark County
- Total acreage in Clark County of public land, private land, and lands under the administration of the following federal agencies:
 - U.S. Forest Service (USFS)
 - Department of Defense (DOD)
 - Water and Power Resources Service (WPRS)
 - U.S. Fish and Wildlife Service (USFWS)
 - National Park Service (NPS)
 - Bureau of Indian Affairs (BIA)
 - Other (FAA, etc.)
- Total acreage in the Stateline Planning Unit and the Virgin Valley Planning Unit
- Total acreage in each planning unit of public land, private land, and lands administered by the agencies listed above
- Total acreage of the Las Vegas Valley Sub-Unit within the Stateline Planning Unit
- Total acreage in the Las Vegas Valley Sub-Unit of public

land, private land, and lands administered by the agencies listed above

Calculation of state-owned lands was not included in the inventory primarily because the only lands that Nevada owns and administers in the Las Vegas District are properties which they have acquired under the R&PP Act which BLM considers private land. (These include state parks and lands acquired for public purpose uses.)

See Table .41-2 for all acreage in Clark County.

The methodology used to determine this acreage was to, first, identify the boundary of Clark County. Each township within that boundary was evaluated to determine the ownership and administration of all acreage within it, in the categories previously discussed. Acreage was subtotaled by ownership or administration, and the subtotals were added to obtain a total acreage for Clark County. Care was taken to avoid including lands having dual administration by DOD and USFWS under both agencies' subtotals and counting those acres twice (Desert National Wildlife Range, Nevada Test Site, Nellis Bombing and Gunnery Range, etc.). Total acreage for the county also does not include water surface acreage of Lake Mead, Lake Mohave, and the Colorado River. Shorelines were delineated on the Master Title Plats (MTPs), but it is unknown whether these shorelines represent the high or low water lines.

The same methodology was used to inventory each planning unit. However, the planning units do not encompass all acreage in Clark County. The Desert National Wildlife Range and the Nellis Bombing Range are not part of either planning unit, and therefore, Department of Defense acreage will represent only some small interior parcels in the Stateline Planning Unit and in the Las Vegas Valley Sub-Unit. It should also be noted that for those townships which adjoin the Nellis Bombing Range or the Desert National Wildlife Range, the MTPs were reviewed to determine which acreage was included in the planning unit and the acreage of the DOD/USFWS withdrawal that was not within the planning unit boundary. This may cause confusion when trying to correlate acreage for DOD between the Clark County total, the Stateline Planning Unit subtotal, and the Las Vegas Valley Sub-Unit subtotal.

TABLE .41-2

CLARK COUNTY LANDS INVENTORY

Owned or Administered	Clark County	Stateline Planning Unit	Virgin Valley Planning Unit	Las Vegas Valley Sub-Unit
Bureau of Land Management	3,097,131	1,990,764	1,106,929	134,700
Private	412,048	321,007	91,041	221,599
U.S. Forest Service	56,600	56,600	—	—
Department of Defense	378,111	15,691	—	15,231
Water and Power Resources Service	50,690	30,171	20,519	8,886
U.S. Fish and Wildlife Service	506,363	—	—	—
National Park Service	498,814	233,870	264,944	2,245
Bureau of Indian Affairs	75,112	3,420	71,692	—
Other (FAA)	<u>140</u>	<u>100</u>	<u>40</u>	<u>—</u>
TOTAL	5,075,009	2,651,623	1,554,603	382,661

Source: 1979 Clark County Lands Inventory, BLM. See the Lands Inventory narrative for an explanation of the methodology used to obtain these acreages. Updated 7/1/81.

Virgin Valley Planning Unit

Overlays

Overlays prepared for the Virgin Valley Planning Unit are as follows:

Current Land Use - shows urban-suburban, agricultural, and public purpose areas.

Rights-of-Way - shows powerlines of 69 kv or more, telephone lines, pipelines, railroads, and communication sites.

Land Classification and Designation - shows withdrawals by other agencies, lands classified for multiple use, and designated areas.

Lands Management Opportunities - shows opportunities for urban-surburban and public purpose disposals, agricultural disposals, and rights-of-way.

1. Land Ownership

The Virgin Valley Planning Unit contains approximately 1,554,603 acres of which 1,463,562 acres or 94% is managed by the Federal government. The Bureau of Land Management has jurisdiction over 1,106,367 acres or 71% of the land within the boundaries of the planning unit.

Federal agencies other than BLM which control federal lands within the planning unit are shown on Table .41-2 and are discussed under Land Withdrawals. Lands not controlled by federal agencies are either privately owned, or owned by state and local governments.

The State of Nevada has large land holdings, partly through Recreation and Public Purpose grants and leases, in Valley of Fire State Park, which accounts for a majority of its surface ownership in this planning unit. Nevada Department of Wildlife has acquired about 2,400 acres of land from BLM which is part of the Overton Wildlife Management Area. Private lands in the planning unit have been patented under the mining and agricultural land laws, and have been limited principally to locations where sources of water, necessary for agricultural production, can be found.

Although the population of Clark County is increasing tremendously as a whole, the population of this planning unit has remained relatively static for a number of years. There are several small communities in the area, but the rest of the

planning unit is generally undeveloped. Land ownership conflicts have not been a problem in this area. The principal demand for land in recent times has been by the State of Nevada which desires to acquire more property for the Valley of Fire State Park. Interest by members of local communities in acquiring property for public recreation sites and other uses has occurred in recent times, and there have been expressions of interest by local residents in selling public lands adjacent to their private holdings. Requests for rights-of-way and similar land uses are made by a variety of public and private agencies. Continuing demand for public lands to accommodate growth is anticipated.

2. Current Land Use

Rural: The communities in the planning unit include Logandale, Overton, Glendale, Mesquite, Moapa, and Bunkerville. They are quite small and historically have been devoted to supporting farming operations in the area. None of the communities are incorporated and therefore fall under the general jurisdiction of the Board of County Commissioners and the direct supervision of the County Administrator. Each town usually has a town board, consisting of citizens elected by town residents. The Boards have no real governmental authority and their purpose is to take care of day-to-day matters as well as serving as a link between residents of the communities and the County Commissioners.

These communities are suburban in character and are shown on the Current Land Use Overlay.

Congress has recently enacted a transfer of approximately 70,000 acres, out of BLM administration to enlarge the Moapa Indian Reservation in the Moapa/Coyote Springs area. The final impact of this action upon pending land use applications is not known, however, little effect upon local communities is anticipated.

Conversely, in the event that all or some portion of the proposed MX missile system is constructed in this area, considerable impacts upon population, land use patterns, and BLM workloads can be anticipated. This impact would be felt especially in the small communities of this planning unit. Under the MX scenario, the need for public lands for all uses would dramatically increase.

While growth of these communities has not been rapid in the past, the need for lands to accommodate expansion has been expressed from time to time. Since these communities are surrounded by federal lands, their growth will increase demand for disposal of public lands. Those additional lands would be utilized for residential, light commercial activities, and R&PP. The need for public lands particularly in the Mesquite area, was identified by

the Virgin Valley Comprehensive Plan, prepared by Clark County in 1979.

*** An opportunity exists to dispose of federal lands in the immediate vicinity of the communities within the planning unit. Disposal could be accomplished by R&PP lease, exchange, or public sale, and would allow continued growth of these communities. Areas which should be considered for disposal are shown on the Lands Management Opportunities Overlay, and any disposals should be coordinated with local governments to insure orderly growth.

Agricultural: Although recreational use contributes significantly to the economy of the planning unit, more significant economic contributors are the agricultural operations that occur in the Moapa and Virgin Valley areas. Primary crops are hay, alfalfa, and other grain and forage crops for use in the livestock industry.

Agricultural operations in this area typically occur on private lands patented under one of the agricultural entry laws. Irrigation is accomplished using deep wells and by allocation of natural runoff, usually in conjunction with center-pivot or lateral-type sprinkling systems. For most forage crops, the long growing season in this area allows two, three, or occasionally four cuttings per year. As in most areas of the southwest, agricultural expansion and development are limited by lack of economically available water.

Present agricultural areas are shown on the Current Land Use Overlay. Local residents have expressed concern over conversion of agricultural lands to residential use, and the subsequent impact upon the local economy and lifestyle. However, since the communities within the planning unit are surrounded by federal lands, continued residential growth will take place, at least in part, on agricultural lands. This creates a possible problem situation since the communities depend heavily on an agricultural economy.

Public Purposes: A significant portion of lands within the planning unit are being utilized for public purposes. These uses include Valley of Fire State Park, Overton Wildlife Management Area, Virgin River Recreation Lands, Virgin Mountain Natural Area, and the Moapa Indian Reservation. In addition, the southern boundary of the planning unit adjoins the Lake Mead National Recreation Area, administered by the National Park Service. The majority of remaining lands under BLM administration are classified for multiple use management.

Local government land holdings are quite limited, consisting of several school sites, fire stations, water and sewer facilities,

and dump sites. In some cases, particularly in the areas of established municipalities, local governmental entities will require public lands for expansion of public facilities, such as sewage plants and sanitary landfills.

Transportation and Rights-Of-Way: Most of the existing rights-of-way accommodate roads or powerlines. However, there are also numerous telephone lines, pipelines, and a few communication sites. The effect of these easements on other resource programs has not been significant. However, the visual impact of some of the larger powerlines is noticeable in parts of the planning unit, especially where several rights-of-way parallel each other. Conversely, concentration of rights-of-way within limited areas prevents their proliferation in other areas of the largely undeveloped planning unit.

Further information relative to transportation and rights-of-way is contained in the BLM Clark County Transportation Plan. Major (69 kv or greater) rights-of-way are shown on the Rights-of-Way Overlay. Continued growth of the communities within the planning unit will require additional rights-of-way of all types, such as utility lines and roads. In addition, the Intermountain Power Project (IPP) and the proposed Allen-Warner Valley Power Project and Rocky Mountain Gas Pipeline Project will require public lands to accommodate them.

The Intermountain Power Project (IPP) proposes to construct and operate a 3,000 megawatt coal-fired electric power generating station in southern Utah. The project is being undertaken by a group of Utah, Nevada, and California municipal electric utilities to enable them to supply their customers with additional electrical energy. Right-of-way for the transmission facilities of this project has been granted.

While it is impossible to predict the exact location of the many routine applications regularly received for smaller rights-of-way, it can be assumed that the majority of requests will be for lands in or near established communities.

There are numerous communication sites in use in the planning unit, the major sites being shown on the Rights-of-Way Overlay and in the BLM Clark County Transportation Plan. Increasing dependence upon electronic communication will place heavier demands on current sites, some of which are already overcrowded.

- *** Opportunities in transportation and rights-of-way include:
- Establish right-of-way corridors to accommodate the major projects identified above, as well as future projects.

Make additional high-elevation sites for communication purposes available in the Arrow Canyon Range, Muddy Mountains, Black Mountains, and Virgin Mountains, as user demand increases.

3. Planning and Zoning

All of Clark County has been zoned at this time through the authority of Title 29 of the County Statutes. However, most of the planning unit has been given an R-U zone. This zoning is established for the vast areas of open land and provides for a very low-density residential use. Uses consist of single-family residences, farming operations, small livestock operations, or mobile homes. With a conditional use permit, additional uses may be allowed such as petroleum pumping, rock crushing or gravel pits, mining, and off-premise signs. Other uses are expressly prohibited.

An overlay has not been prepared showing zoning because it changes from time to time. The County Planning Department should be consulted when such information is needed. The general purpose of the Zoning Ordinance of Clark County is for "...promoting the health, safety, morals, or general welfare of the present and future inhabitants of Clark County and divide the county into districts and sets forth the regulations pertaining to such districts in accordance with the General Plan for Clark County..." (Section 29.01.020, County Statutes). Because all of the communities in this planning unit are unincorporated, no additional zoning may be imposed by these communities.

Several master plans and other planning studies have been prepared for use by local communities, Clark County, and other agencies. A list of some of these which are available in the District library (File Code 1600) are given in Table .41-3. This table represents all available plans for Clark County, and is referred to in other sections of this URA.

The plans prepared for this area generally do not propose to change the existing uses to a major degree; however, they do attempt to place more emphasis on urbanization of the area, and tend to encourage an orderly transition from agricultural to urban uses, with more reliance on recreation, rather than agriculture, as a source of revenue for the local residents.

*** Coordination efforts with local planning agencies should be continued to insure compatible land uses between private and public lands, and to insure that public purpose needs for BLM administered lands are identified.

TABLE .41-3
CLARK COUNTY
MASTER PLANS AND OTHER PLANNING STUDIES

Area Covered	Initiating Agency	Preparer	Year Completed	Subject of Plan
Boulder City	City of Boulder City	--	1967	--
Clark County	Regional Planning Council	Regional Planning Council	1971	Regional Parks Study for Clark County
*Clark County	Regional Planning Council	Clark County Department of Comprehensive Planning	1977	Regional Comprehensive Plan
Indian Springs	Clark County Board of Commissioners	*Clark County Department of Comprehensive Planning	1979	Land Use and Development Plan
Las Vegas Valley	Clark County Planning Commission	Eisner-Stewart	1965	The General Plan for the Las Vegas Valley, Clark County Master Planning Program
Las Vegas Valley	Bureau of Land Management	Gerhard N. Rostvold	1965	Economic growth and public land planning in the Las Vegas Valley
Las Vegas Valley Incorporated Area	Clark County Planning Commission	Eisner-Stewart	1965	Regional Plan for unincorporated areas in Las Vegas Valley
Laughlin	Clark County Board of Commissioners	*Clark County Department of Comprehensive Planning	1980	Land Use and Development Plan
Moapa Valley	Water and Power Resources Service	Water and Power Resources Service	1962, 1971	Reconnaissance Report on the Moapa Valley Pumping Project

TABLE .41-3 (continued)
CLARK COUNTY
MASTER PLANS AND OTHER PLANNING STUDIES

Area Covered	Initiating Agency	Preparer	Year Completed	Subject of Plan
Moapa Valley	Resource Action Council	Farren W. Bunker, County Extension Agent	1970	Moapa Valley Resource Inventory
Moapa Valley, Virgin Valley, Indian Springs and Recreation Areas	Clark County Planning Commission	Eisner Stewart	1966	Community Design Plans for Moapa Valley, Virgin Valley, Indian Springs; Park Design Plans for Red Rock Canyon, Valley of Fire Lake Mead
Virgin Valley	Resource Action Council	Farren W. Bunker, County Extension Agent	1970	Virgin Valley Resource Inventory
Virgin Valley	Clark County Planning Commission	Clark County Department of Comprehensive Planning	1979	Comprehensive Plan for Communities of Mesquite and Bunkerville, including identification of public lands needed for community expansion

*The Regional Comprehensive Plan is presently being revised by Clark County Department of Comprehensive Planning.

4. Land Classification and Designation

The Land Classification and Designation Overlay shows the general classification status of federal lands within the planning unit. Detailed information concerning multiple use classifications is contained in case files, N-1575 (1/24/69) and N-1575A (9/25/70), available through the BLM Nevada State Office. It should be noted that those lands affected by Classification Order N-1575A are segregated from disposal by exchange, since these lands were considered to have value for public purposes. Both of these classification orders segregated the lands involved from the operation of the agricultural land laws, and further segregated certain parcels from mineral location.

In addition to the classifications completed in the planning unit, two sites have been designated under the provision of 43 CFR 2070, as having unique physical characteristics, or because of their value for outdoor recreation. These are shown in Table .41-4, with a brief description of the purpose of the designation. See the Land Classification and Designation Overlay for the location of the areas involved.

TABLE .41-4
Virgin Valley Planning Unit

DESIGNATED AREAS

<u>Name</u>	<u>Acres</u>	<u>Purpose</u>	<u>Designated</u>
Virgin River Recreation Lands	4,930	Protection of the habitat of interesting, rare, and unusual plants and animals	9-25-70
Virgin Mountain Natural Area	6,560	Protection of unusual flora and fauna found nowhere else in southern Nevada	9-25-70

5. Land Withdrawals

Lands have been withdrawn throughout the planning unit for use by a number of federal agencies. Withdrawals in effect within or adjoining the planning unit are listed in Table .41-5.

TABLE .41-5
Virgin Valley Planning Unit

LAND WITHDRAWALS

<u>Agency</u>	<u>Acres</u>
National Park Service (Lake Mead)	264,944 acres
Federal Aviation Administration	40 acres
Bureau of Indian Affairs (Moapa Indian Reservation)	71,692 acres
Bureau of Reclamation	20,519 acres

The southern boundary of the planning unit adjoins the Lake Mead National Recreation Area, which is composed primarily of withdrawn lands administered by the National Park Service and the Water and Power Resources Service. While not administered as part of the Virgin Valley Planning Unit, the withdrawals involved, as well as all withdrawals within the planning unit boundaries, will be subject to review. An ongoing withdrawal review program is in effect at this time.

Major withdrawals are noted on the Land Classification and Designation Overlay.

6. Leases and Permits

The only leases administered by the Lands Program and outstanding within the planning unit are those issued in response to Recreation and Public Purpose Act applications. Mineral leases are discussed in Section .42, Minerals.

Few R&PP leases are in effect in this planning unit. Additional R&PP applications to obtain public lands for public purpose/use are on file.

Permits granted within the planning unit are generally Temporary Use Permits (TUPs), which are granted for a period of less than twelve months. These permits are granted for such uses as temporary roads, soil surveys, temporary communication sites, and other activities.

Section 302 of the Federal Land Policy and Management Act provides for leasing of public lands for cultivation, habitation, and development of small trade or manufacturing concerns. Public interest in such leasing has been expressed from time to time. In conjunction with local planning, leased federal lands could satisfy at least a portion of the demand for public lands for suburban expansion, particularly where fee title disposal is inappropriate or undesirable.

*** In conjunction with sale or exchange of public lands adjacent to suburban expansion areas, the option of leasing these lands

should also be considered. The areas where disposal is desirable are shown on the Lands Management Opportunities Overlay.

7. Unauthorized Use

The primary documented unauthorized use in the planning unit is unintentional occupancy trespass. This type of trespass is generally resolved by disposal where appropriate. In addition, unauthorized dumping and other nuisance trespass occurs in scattered areas throughout the planning unit.

It is reasonably certain that many trespass situations occur that are not detected. This is due primarily to lack of funding and priority for trespass detection and case work. An accurate assessment of the quantity and severity of trespass occurrence is impossible to make at this time, due to lack of data.

8. Land Surface Quality

The overall quality of the lands within the planning unit is good, due to low level of use, sparse population and the general lack of development. See Section .47D, Visual Resource Management, for more specific information on surface quality.

9. Water Needs

At this time, no BLM-claimed waters are being developed for domestic use. All water appropriations in Nevada are controlled by the State Water Engineer. Water is generally unavailable in quantities large enough to promote significant agricultural or industrial development. A large-scale project, such as the proposed MX system, would severely tax available water supplies, with potential for extracting waters from below public lands.

A complete discussion of water resources and potentials is contained in Section .35, Water Resources, and Section .45, Watershed.

Stateline Planning Unit

Overlays

Overlays prepared for the Stateline Planning Unit are as follows:

Current Land Use - shows urban-suburban, rural, agricultural, residential, commercial, and industrial land uses; pipelines; airports; and communication sites

Public Purpose - shows present public purpose leases and rights-of-way, including recreation purposes, sanitary landfills, and sewage treatment plants.

Rights-of-Way - shows present railroad and powerline (69 kv or larger) rights-of-way

Land Classification and Designation - present land classifications and designated areas

Withdrawals - shows present land withdrawals

Lands Management Opportunities - shows opportunities for rights-of-way and right-of-way corridors, communication sites, airports, and sewage treatment facilities.

1. Land Ownership

The Stateline Planning Unit contains 2,651,623 acres of land, of which 1,990,764 acres or 75% is administered by the Bureau of Land Management. Other federal agencies control 339,852 acres within or immediately adjoining the boundaries of the planning unit. These lands have been withdrawn from the operation of specific public land laws, and are set aside for specific purposes or federal programs. Such lands include the Las Vegas Ranger District of the Toiyabe National Forest, Nellis Air Force Base, Lake Mead National Recreation Area, and portions of the Nellis Air Force Bombing and Gunnery Range, etc.

The extensive federal land holdings within the planning unit have caused many public agencies and private individuals to request that more lands be placed into private ownership. This is illustrated by the fact that federal legislation has been enacted that allows the State of Nevada (through the Division of Colorado River Resources) to purchase large acreages of federal land. The Fort Mohave Act allotted 15,000 acres, of which 6,000 acres have been disposed of, and the Eldorado Act allotted 107,432 acres (not including lands relinquished January 29, 1960) of which none has been disposed.

Many of the lands which have been transferred out of public ownership outside the Las Vegas metropolitan area were disposed of through the Small Tract Act of 1938. Applications for small tracts were occurring at a rate of about 15,000 per year up to 1964, when these areas were closed to further filing. While a few applications are still outstanding, most disposals have been completed. There remains a large acreage of scattered parcels of public land that are still classified for small tract disposal, however the lands are not open to application, due to the repeal of the Small Tract Act.

Approximately 321,007 acres within the planning unit are in state or private ownership. The only major state holding is the Spring Mountain Ranch State Park. Private lands in the Las Vegas Sub-unit will be discussed in that section. The majority of private lands outside the Sub-Unit are concentrated around the numerous small communities in the planning unit. Many isolated parcels occur as a result of agricultural entries and mining patents.

(NOTE: The remainder of the analysis of the Stateline Planning Unit will exclude those lands within the Las Vegas Valley Sub-Unit, unless stated otherwise. The boundary of the Sub-Unit corresponds to the planning area recognized by Clark County Comprehensive Planning as the Las Vegas Valley, and is illustrated on all Stateline Planning Unit Overlays.)

The only community of any size in the planning unit is Boulder City (population 10,100). Other communities in the planning unit are relatively rural and include the unincorporated areas of Blue Diamond, Sloan, Sandy, Jean, Goodsprings, Nelson, Mount Charleston, Indian Springs, Cactus Springs, Laughlin, and Searchlight.

All of these communities, including Boulder City, are substantially surrounded by federal lands, primarily administered by BLM. The major use of the private lands within these communities is for residential and commercial enterprises. Some of the private lands in the planning unit are utilized for agricultural purposes (Sandy Valley), and mining operations, such as the Flintkote gypsum mine at Blue Diamond.

The isolated parcels of private land occurring throughout the planning unit are primarily used for residential purposes or for ranching operations.

See Table .41-2 for a detailed breakdown of land ownership and administration in the planning unit.

Significance of the Land Ownership Pattern: The large blocks of public lands within the planning unit facilitate management and

the implementation of BLM programs. The local population of the communities in the area rely on the surrounding public lands to provide the land base for a variety of recreation and public purpose uses including schools, sanitary land fills, parks, sewage lagoons, and airports, as well as for residential and commercial expansion when the need arises.

Areas adjacent to the Las Vegas Valley Sub-Unit area present several land management difficulties because of the segmented land pattern of public and private holdings. Specifically, traditional BLM programs are incompatible with urban expansion needs. The granting of rights-of-way by BLM across public lands is an expense to the federal government, while management potential is limited. The necessity of granting these rights-of-way can also lead to delays in development, growth, and provision of utility services to private lands. The current ownership pattern also contributes to unauthorized land uses such as illegal dumping.

2. Current Land Uses

See the Current Land Use Overlay for delineations of lands in the following categories.

Urban-Suburban: Exclusive of the Las Vegas Valley Sub-Unit (metropolitan Las Vegas), the urban-suburban area of the Stateline Planning Unit consists of the community of Boulder City and the outlying areas of the Las Vegas metropolitan area.

Boulder City began as a government construction camp for the workers employed on the Boulder Canyon Project. Today the city is primarily a residential community with a population of approximately 10,000 people. About 65 percent of all housing units are single-family dwellings, 20 percent are mobile homes, and 15 percent are multiple-family units.

The economy of Boulder City is stabilized primarily by the commercial enterprises which cater to tourists who frequent the Lake Mead National Recreational Area and other places of interest along the Colorado River. The commercial enterprises consist of fast food restaurants, hotels/motels, grocery stores, drugstores, sporting good stores, and other establishments.

In addition, the city has had some success in attracting light industries to the community. An industrial area has been established for this purpose and is located along U.S. Highway 93 west of the center of the city. The following companies have recently located in the community: Fisher (writing pens), Simtec (electronics), Voge Ski (ski equipment), and Vita Plus (vitamins).

Because the city owns and operates its own water, electricity, and sewage collection and treatment systems, the rate of growth is dependent on the capabilities of existing systems.

The citizens of Boulder City passed a growth control ordinance under Title II of the Boulder City Code, to establish control over the quality, distribution, and rate of expansion of the city. The objectives of residents in enacting this ordinance were to preserve the quality of life in the community, insure the adequacy of the city facilities and services, insure a balance of housing types to meet various family needs, and insure the balanced development of the city.

The initial construction year for this growth ordinance was for the fiscal year beginning July 1, 1979, and ending June 30, 1980. Under this ordinance dwelling units for the initial year were limited to 120. Actual construction, including dwelling units exempt from development control, shall be reviewed on an annual basis and the next year's allotment adjusted accordingly, but not to exceed 12 dwelling units over the previous year's dwelling unit allotment. Similar controls have been placed on commercial development in Boulder City.

The population estimate of Boulder City as of June 1, 1979, is 10,100 people, and the city projects that it will have a population of 16,100 people by the year 2000. Boulder City has the option to acquire up to 19 square miles of contiguous public land near the Eldorado Valley, through the Colorado River Resource Commission pursuant to the Eldorado Act previously mentioned. Therefore, it is doubtful that additional public lands will be needed to meet future expansion needs of the community during the indicated time span.

Land uses in the outlying areas of the city of Las Vegas are almost exclusively confined to residential housing units. The commercial and industrial segment have not yet been developed in these areas.

The area between U.S. Highway 95 and the Desert National Wildlife Range/Nellis Bombing and Gunnery Range (DNWR/NBGR) and stretching from the eastern line of R.59E. to the Clark/Nye County line has not been grazed for many years. It is unallotted at present. Both the highway and the DNWR/NBGR are unfenced. Given the very slim distance between the two boundaries, livestock would cause an immediate trespass problem on DNWR/NBGR and a severe safety hazard to motorists traveling Highway 95.

*** The opportunity exists to withhold licensing of ephemeral forage use on this area until both the DNWR/NBGR and the northeast side of Highway 95 are fenced.

Rural: The rural areas in the Stateline Planning Unit encompass the unincorporated communities of Blue Diamond (population 220), Indian Springs (930), Cactus Springs (20), Sloan (10), Goodsprings (230), Sandy (130), Jean (150), Nelson (50), Searchlight (450), Laughlin (200), and Mount Charleston (100) (Clark County Department of Comprehensive Planning).

The lands within these communities are primarily used for residential purposes, with dwellings primarily consisting of mobile homes and single family houses. These communities are relatively stable with respect to population because of their distance from the Las Vegas metropolitan area, and limited services and employment opportunities. All are experiencing steady growth.

Most of the communities are located along major transportation arteries. The commercial interests within these communities are mainly geared to the tourists who frequent the hotels and casinos of Las Vegas. As such, the commercial sector consists primarily of proprietorships, including service stations, convenience stores, bar and cafe operations, and motels.

Considerable growth has occurred in Laughlin in recent years as a result of gaming and resort developments. Under the Fort Mohave Act, several thousand acres of land have been purchased by the State of Nevada in this area. The town of Laughlin has also requested the disposal of BLM administered lands near the community. This would circumvent the procedure outlined in the Fort Mohave Act, which provided for transfer of federal lands to the Colorado River Commission. In addition, the Laughlin town board has requested that the direct BLM disposals be limited to Laughlin residents or employees of local businesses.

Agricultural: Developed irrigated agricultural lands within the planning unit are located almost exclusively in Sandy Valley along the California border. Agricultural production on these lands is primarily alfalfa and other forage crops.

At the present time there is widespread interest throughout Nevada regarding public lands that have potential for agricultural production. This interest was generated by the reopening of public lands to agricultural applications under the Carey Act and the Desert Land Act. Hundreds of applications have been received for lands within the planning unit.

There are no areas within the planning unit where dryland farm practices can be implemented, due to the desert environment of the area. However, the forage from both private and public lands are utilized for livestock production. Currently, there are 14 livestock operators within the planning unit who are licensed by the BLM.

Public Purposes: See the Public Purpose Overlay for specific locations of the following areas.

Recreation: There are three major recreational areas in the Stateline Planning Unit which are utilized extensively both by Las Vegas residents and by visitors. These areas are the Red Rock Canyon Recreation Lands, the Mt. Charleston area of the Toiyabe National Forest, and the Lake Mead National Recreation Area. Each of these areas provides its unique attractions within a short distance of Las Vegas. In addition, there are two recreation leases under the R&PP Act, for archery and for rifle and pistol shooting.

Red Rock Canyon: The Red Rock Canyon Recreation Lands (RRCRL) are located on the eastern slope of the Spring Mountains, approximately 15 miles west of the city of Las Vegas. These recreation lands encompass approximately 62,000 acres of publicly owned lands and are administered under a cooperative agreement between the BLM and the Nevada State Park System. Refer to Section .47A, Recreation, for more detailed information.

The RRCRL is bordered on the east by large tracts of land owned by the Summa Corporation. The opportunity exists to acquire these lands through exchange or purchase to protect the integrity of the RRCRL.

Toiyabe National Forest: Recreation use on the Las Vegas Ranger District of the Toiyabe National Forest is heavy. Locally referred to as Mount Charleston, this area is the only alpine-type environment relatively close to the Las Vegas metropolitan area. Visitor use spans all seasons, with snow skiing in winter months and camping, hiking, and picnicking the rest of the year. See Section .47A, Recreation, for more detailed information.

*** An opportunity exists to provide public lands within the Las Vegas Valley Sub-Unit for exchange for private tracts within the National Forest, particularly within the Las Vegas Ranger District. The U.S. Forest Service anticipates a potential need for up to 25 acres per year of public lands in the Las Vegas area to facilitate these exchanges. Exchanging scattered parcels of BLM administered public lands in the Las Vegas area for private lands within the National Forest would alleviate management problems for both agencies.

Lake Mead: The Lake Mead National Recreation Area was created around the two large lakes created by the construction of Hoover and Davis Dams on the Colorado River. It is administered by the National Park Service and covers over 3,000 square miles in Nevada and Arizona, much of it canyon-cut picturesque desert. The area offers year-round water recreation with the peak season occurring during the summer.

Recreation Leased Land (R&PP Act): Two tracts of public land are presently leased under the Recreation and Public Purpose (R&PP) Act for an archery range and shooting range, respectively. These lands are identified on the Public Purpose Overlay and in Table .41-6.

TABLE .41-6
Stateline Planning Unit

RECREATION LEASED LAND

<u>Applicant</u>	<u>Serial Number</u>	<u>Lease Period</u>	<u>Effective Date</u>
Desert Sportman's Rifle and Pistol Club	N-1114	20 years	3/1/69
Las Vegas Archers Inc.	N-7576	20 years	5/15/75

Solid Waste: Solid waste collection services are provided by private franchise contractors within the planning unit. Subscription to contractor service is required of residents of Boulder City. The communities of Blue Diamond and Indian Springs are provided collection service by local franchise operators with subscription on a voluntary basis. In the more rural areas, no collection service is available and residents must transport their solid waste to a local landfill.

Clark County is responsible for solid waste disposal and site maintenance of landfills located on public lands. Table .41-7 is a summary of existing sanitary landfills that are maintained by the county on public lands under R&PP lease.

TABLE .41-7
Stateline Planning Unit

SANITARY LANDFILLS UNDER R&PP LEASE

<u>Site and Serial Number</u>	<u>Land Description</u>	<u>Acreage</u>
*Blue Diamond (Nev 066747)	T.22S., R.58E., Sec 12, SW1/4NE1/4	40 acres
#Goodsprings (No record)	T.24S., R.58E., Sec 36, NE1/4NE1/4	40 acres
Indian Springs (Nev 064225)	T.16S., R.56E., Sec 15, E1/2SE1/4	40 acres
Mt. Charleston (N-10604)	T.19S., R.58E., Sec 30, NE1/4SE1/4	20 acres
#Nelson (No record)	T.29S., R.63E., Sec 12, NW1/4SW1/4	
Sandy Valley (N-7838)	T.24S., R.57E., Sec 27, S1/2SE1/4	10 acres

* The Blue Diamond landfill site has been condemned by the Clark County Health Department. The Department of Public Works, Clark County, is in the process of filing an amended R&PP application for another site.

Both of the sanitary landfill sites at Goodsprings and Nelson are not authorized. These sites are presently maintained by Clark County, and the Department of Public Works has filed the needed R&PP lease applications to maintain these sites in good standing.

Clark County has also notified the BLM that they will file an R&PP lease application for a sanitary landfill to facilitate solid waste disposal in the Laughlin area. A specific site for this landfill has not yet been designated.

Sewage Plants: Clark County Sanitation District No. 1, under the Clark County Commission, is responsible for the sewage collection and treatment and the disposal needs of the unincorporated areas of Clark County. The Sanitation District operates and maintains collection and treatment facilities in the Las Vegas Valley and several rural areas including the community of Searchlight.

Boulder City maintains its own wastewater collection and treatment system. The collection system is divided into the Hemenway Wash area draining northeast to Lake Mead and the Eldorado Valley area draining due south from Boulder City. The treatment facility consists of two 10-acre lagoons.

The sewage treatment facilities in the rural areas of the planning unit consist of lagoon systems and/or septic tanks. Table .41-8 summarizes the existing lagoon systems in the planning unit.

TABLE .41-8
Stateline Planning Unit
SEWAGE LAGOON SYSTEMS

<u>Community</u>	<u>Ownership</u>
Jean (*)	private
Searchlight	Clark County
Indian Springs	private
Blue Diamond	private
Laughlin	private

(*) The State Minimum Security Correctional Center at Jean is served by a lagoon system. However, the community of Jean utilizes septic tank disposal systems.

The immediate concern of the Clark County Sanitation District involves the Mt. Charleston area of the Toiyabe National Forest and the communities of Searchlight and Laughlin.

Mt. Charleston Area: The existing sewage treatment facilities in the Mt. Charleston area consist of septic tank disposal systems. The area receives heavy recreational use, and continued subdivision of private lands within the Kyle Canyon, Deer Creek, and Lee Canyon areas will require more substantial sewage treatment facilities in the future.

The Sanitation District has filed an expression of interest with the BLM for public lands in the Lee Canyon and Kyle Canyon areas to accommodate future wastewater treatment facilities. The subject lands are

shown on the Public Purpose Overlay. The lands identified by Clark County are in Lee Canyon (T.18S., R.57E., SW1/4 Sec. 19) and Kyle Canyon (T.19S., R.57E., W1/2SW1/4 Sec. 27 and E1/2SE1/4 Sec. 28).

Searchlight: The existing sewage treatment facility was designed for 300 people. The present population of Searchlight is 400 people. The system is already operating in excess of design capacity, while some of the community residents do not have their homes hooked up to the system. Therefore, additional treatment facilities will be required in the future as sewage hookup becomes mandatory.

The Sanitation District has filed an expression of interest to acquire additional public land from the BLM to meet future plant expansion needs. These lands are shown on the Public Purpose Overlay and were identified by Clark County as T.29S., R.63E., S1/2NE1/4NE1/4, Sec. 2.

Laughlin: Currently the only residential development within the Laughlin area served by a community sewage system is a small, privately owned subdivision at Rio Alta Vista, known as Sundance Shores Development. Along the shores of the Colorado River and proceeding north from the subdivisions are four hotel/casino establishments and three trailer parks. Each of the hotels owns and operates its own sewage treatment plant with the exception of the Colorado Hotel which utilizes the Rio Alta Vista package treatment plant.

The existing sewage treatment facilities of the Laughlin area are inadequate to meet the anticipated expansion needs of the community. Contributing to this anticipated growth is the expanding tourist trade along the Colorado River and the proposed transfer of the remaining 9,000 acres of public land to the State of Nevada under the Fort Mohave Act for community expansion.

The Sanitation District has filed an expression of interest with the BLM for public land to accommodate the needed sewage treatment facilities. The subject lands are shown on the Public Purpose Overlay and are identified by Clark County as 60 acres within R.66E., NE 1/4 and W1/2NW1/4 Sec. 14.

Transportation and Rights-of-Way: Major existing rights-of-way are shown on the Current Land Use and Rights-of-Way Overlays. Details of various transportation systems and rights-of-way in

Clark County are contained in the BLM Clark County Transportation Plan, Section .39B, Access. Major categories of rights-of-way are as follows:

Roads and Highways: Major roads and highways within the planning unit include Interstate Highway 15, and U.S. Highways 93 and 95. In addition, several State of Nevada Highways connect various communities or other highways. There are also numerous county roads and streets. Roads and highways are shown on overlays prepared for Section .39B, Access.

A number of roads were constructed by local government under the Revised Statute 2477 authority, which allowed state and local governments to utilize unappropriated, unreserved public lands for roads without application or approval by any Federal agency. This statute has been repealed, and new road construction under P.L. 94-579 requires application and approval prior to construction. However, the many roads constructed under R.S. 2477, while existing legitimately, are not noted on the public land records.

Clark County has submitted maps of those streets and roads which were constructed under the R.S. 2477 authority, and which they wish to retain, as well as other presently used and maintained roads and streets. This information appears in the BLM Clark County Transportation Plan.

Railroads: Las Vegas is situated on the main line of the Union Pacific Railroad between Los Angeles and Salt Lake City. Amtrak carries passengers to and from Las Vegas, and freight can be transferred at its Clark County stops. Jean is the only stop along this line which falls within the planning unit boundaries, but passenger service is not presently available there. See the Rights-of-Way Overlay.

Airports: There are three public airports serving commercial and general aviation, located at Jean, Searchlight, and Boulder City. In addition to serving the immediately adjacent areas, the airports at Jean and Boulder City often act as "reliever" airports for general aviation flights which would otherwise use McCarran International Airport in the Las Vegas Valley Sub-Unit.

These airports are generally ill-suited for heavy use to due to size, facilities, location, and safety-related factors. Specifically, the airports at Jean and Searchlight consist only of landing strips with no facilities. The Boulder City airport is limited to its present capacity because of its proximity to developed areas. In addition, the Boulder City

runway gradients exceed the FAA recommended standard 2.0% slope. See the Current Land Use Overlay.

Information was submitted by John D. Solomon, Director of Aviation, McCarran International Airport, which depicts the location of a proposed reliever airport at Jean, Nevada. Under this proposal the existing landing strip at Jean would be closed, and a new airport facility would be constructed two miles south-west of the community.

Although the size of the airport depends largely on the specific site, maximum land acquisition needs have been suggested by the FAA publication FAA AC 150/5300-4B, "Utility Airports". A general utility airport with two parallel 5,000 foot runways and a 5,000 crosswind runway will require at least 315 acres. Land acquisition should include 250 feet on either side of the runway centerline and 200 feet at each end for runway safety areas, runway clear zones, and a building area of approximately 24 acres.

Boulder City has retained Wadell Engineering Corporation of San Francisco to perform a site selection and master planning study for the Boulder City Airport to meet the general aviation needs of the area through the year 2000.

The city is presently in the process of developing plans for construction of an airport southwest of the present facility. The land is located in the Eldorado Valley and is currently administered to by the Bureau of Land Management. In 1958, Congress passed an Act commonly referred to as the Eldorado Valley Act, which set aside 127,000 acres of land in the Valley, giving the State of Nevada, through the Colorado River Commission, the option to purchase the land at an appraised value of over 1.2 million dollars.

As a result, the Colorado River Commission has prepared three concepts of a general plan of development. Each concept includes an area reserved for airport development. Hence, the proposed airport site is compatible with future land development of the Eldorado Valley Area. It is probable that Boulder City will seek to purchase the needed land through the state under the Eldorado Act, or will seek a special legislative transfer. See the Lands Management Opportunities Overlay.

Communication Sites: There are eight major communication site areas within the planning unit. All of these sites are provided with access and power. These areas could possibly accommodate other frequencies, per FCC approval. These sites are shown on the Current Land Use Overlay and are discussed in Table .41-9.

TABLE .41-9
Stateline Planning Unit

COMMUNICATION SITE AREAS

<u>Site</u>	<u>Number of Users</u>
Angel Peak	16
Black Mountain	9
Christmas Tree Pass	6
Lower Mt. Potosi	11
Upper Mt. Potosi	8
Coast Guard (near Searchlight)	1
Nelson	3
Laughlin	1

Dramatic increases in use of electronic communication have created a corresponding increase in use of mountaintop communication sites, with some sites reaching their capacity for development. The importance of these sites for all types of communication cannot be overemphasized.

*** An opportunity exists to provide users with additional communication sites, upon demonstration of need. Potential sites are shown on the Lands Management Opportunities Overlay.

Electrical Power Service: There are numerous power and telephone lines crossing public lands within the planning unit under right-of-way permit. Because of the sheer number of transmission lines, only powerlines that have a capacity of 69 kv or larger will be considered in this discussion. However, a full description of all existing power transmission and distribution rights-of-way appears in the BLM Clark County Transportation Plan. Also see the Rights-of-Way Overlay.

Electrical power is furnished to residents within the planning unit by Nevada Power Company, California Pacific Utilities Company, and Valley Electric Association. Boulder City is the only community within the planning unit that operates its own distribution facilities.

A portion of the hydroelectric power generated at Hoover and Davis Dams is distributed by Nevada Power Company through its transmission network. A major portion of the hydroelectric power generated at these sites is transmitted to California, and some of the power is also distributed through Rural Electrification Administration lines outside of the planning unit.

Nevada Power Company is also a partner of a consortium of public utility companies which operate the coal fired generating plant at Ft. Mohave, north of Laughlin. A portion of the power generated by this plant is received by Nevada Power Co. through its distribution system. In addition, Nevada Power operates the Reid Gardner coal fired generating stations. Power from these two plants is also distributed to the planning unit.

The Navajo-McCullough transmission line, an interstate powerline, is used to transmit power from Page, Arizona, to southern California. A portion of the power produced at Page is transmitted through the distribution system of Nevada Power Company within the planning unit.

Energy and non-energy transmission lines are proposed to be constructed for the following projects and are shown on the Lands Management Opportunities Overlay.

Intermountain Power Project: The Intermountain Power Project (IPP) proposes to construct and operate a 3,000 megawatt coal-fired electric power generating station in southern Utah. The project is being proposed by a group of Utah, Nevada, and California municipal electric utilities to enable them to supply the residents of their respective areas with additional electrical energy. Right-of-way for the transmission facilities of this project has been granted. However, the City of Henderson has rejected plans for that portion of the project proposed within the Henderson city limits.

Allen-Warner Valley: Four utilities have applied to the BLM for the right to develop the proposed Allen-Warner Valley Energy System on public lands. The participating utilities propose to construct and operate a 2,500 megawatt coal-fired electric generating system in southern Utah and Nevada.

A 500 megawatt generating station and a 25,000 acre-foot reservoir would be located in Warner Valley, Utah. A 2,000 megawatt generating station would be located in Dry Lake, Nevada (Virgin Valley Planning Unit). Ten million tons of coal would be mined annually from the Alton coal fields of southern Utah by surface and underground mining methods. Two coal slurry pipelines would transport the coal to the generating stations. A 10,619 mile transmission system and supporting communication system would deliver power to market areas in Utah, Nevada, and California.

On January 19, 1981, the Secretary of Interior approved the Harry Allen Plant, the coal slurry pipeline from

the Alton coal fields, the I-15 transmission line routing, and the wastewater pipeline from Las Vegas Wash to the Harry Allen Plant. A decision on the Utah plant was postponed.

Public lands in the Stateline Planning Unit would be affected by the Allen-Eldorado-California transmission line (two 500 kv lines with separate towers), the Allen-Pecos transmission line (two 345 kv lines with single towers), and the Allen wastewater pipeline. See the Lands Management Opportunities Overlay.

McCullough-Davis: This proposed 230 kv line would be used to transmit power from Hoover Dam to Lake Havasu and Phoenix, Arizona, as part of the Granite Reef Aqueduct System to provide power for the Central Arizona Project. Preliminary planning has proposed a U.S. Power and Water Resources Service project, although no firm commitments or time frames have been established.

Northwest Intertie: This proposed 750 kv DC transmission system would be used to increase the intertie capabilities of the Western United States power grid. The proposed alignment is currently noted on public land records, and the line would be constructed in the western portion of Clark County. In addition, other utilities including Valley Electric Association have formally expressed a desire to construct lines within or parallel and adjacent to this major powerline. This presents the additional opportunity of designating this alignment as a right-of-way corridor, as depicted on the Lands Management Opportunities Overlay.

Transmission Line Corridors: The transmission lines to southern California are located within well-defined areas. Specific areas along these transmission lines have been recommended for corridor designation. The designation is not a commitment to issue any future rights-of-way within the corridor. Approval of future rights-of-way within designated corridors will be subject to the provisions of the Federal Land Policy and Management Act, including Title V, and other applicable laws.

Telephone Service: Although telephone service in the planning unit is furnished by five companies, the vast majority of all service is provided by the Central Telephone Company. Most telephone rights-of-way are for local service, with long distance communications via microwave.

Natural Gas Pipelines: Natural gas is provided in the planning unit by the Southwest Gas Corporation. Gas is provided to Southwest Gas by the El Paso Natural Gas Company from its pipelines near Topcock, Arizona. See the Current Land Use Overlay.

Rocky Mountain Natural Gas Pipeline system is in the planning stage and would bring natural gas from Wyoming to southern California. A portion of this system would traverse the planning unit and has been identified on the Lands Management Opportunities Overlay.

3. Planning and Zoning

All of Clark County has been zoned at this time through authority of Title 29 of the County Statutes. Most lands outside of the Las Vegas Valley area have been given an R-U zone designation, which allows for such uses as single family residences, farming operations, or mobile homes. Minimum lot size is 40,000 square feet. With a conditional use permit, petroleum pumping, rock crushers, gravel pits, mines or mining, and off-premise signs may be allowed. Other uses are expressly prohibited.

An overlay has not been prepared showing zoning because it is continually changing. Current zoning for Clark County can be obtained at the County Planning Department. The general purpose of the Zoning Ordinance for Clark County is for "...promoting the safety, health, morals or general welfare of the present and future inhabitants of Clark County and divides the county into districts and sets forth the regulations pertaining to such districts in accordance with the General Plan for Clark County..." (Section 29.01.020, County Statutes.)

County zoning is applicable outside the incorporated limits of cities, where city zoning is in effect. Again, the zoning is subject to change and one should consult the community involved when utilizing the zoning data to insure that it is current.

Several master plans have been prepared for use of local communities and other agencies in the Las Vegas area and Clark County. A list of some of the available planning documents that have been prepared, which are available in the BLM library, are given in Table .41-3.

These plans have been prepared for the major centers of population by the various entities involved. Major changes for the area are not projected in these planning studies, except for the changes that will be necessary because of population influx into the county. The data and plans appear to be suitable; however, the amount of reliance being placed on the recommendations is questionable. The growth rate of the area,

especially the Las Vegas Valley, has made planning efforts very difficult.

*** Coordination efforts with local planning agencies should be continued to insure compatible land uses between private and public land management.

4. Land Classification and Designation

The base maps show most of the multiple use classifications and mineral segregations that are currently in effect for the planning unit. In addition to mineral segregations, several other forms of segregation have been imposed on some of the lands classified for multiple use management. These are indicated on the Land Classification and Designation Overlay.

Segregation from mining, but not from mineral leasing or material sales, was made for areas that had valuable resources that would be disturbed if such activity were to take place. Such areas include lands having recreational, wildlife, or other values that could be impacted if mining were to be allowed. Segregations from disposal under the homestead, desert land, and general allotment land laws were made because of a lack of sufficient water for agricultural production, and the poor quality of soils that occur in many of the areas.

Many other lands were segregated from disposal under the Public Land Sale Act of 1964 (P.L. 88-608) and R.S. 2455, pending completion of planning studies to be made for public lands within the planning unit. These statutes have since been repealed. Segregation from exchange was made in two of the classifications because most of the lands were considered to have value for local governmental use, or value for retention for public purposes, such as recreation or wildlife habitat. It was not considered proper to allow such lands to be classified for exchange. Table .41-10 is a summary of the current multiple use classifications in effect in the planning unit.

In addition to multiple use classifications, several areas have been designated under the provisions of 43CFR 2070 (Special Designations) because of their unique physical characteristics, or because of their value for outdoor recreational use. These are summarized in Table .41-11 with a brief description of the purpose of designation.

5. Land Withdrawals

Various lands throughout the planning unit have been withdrawn by several federal agencies.

TABLE .41-10
Stateline Planning Unit

MULTIPLE USE CLASSIFICATION

<u>Name of Classification</u>	<u>Serial Number</u>	<u>Acres Classified</u>	<u>Type of Segregation</u>
Clark County	N-1575	1,265,160	Agricultural Land Laws and R.S. 2455
Clark County	N-1575	540	Additionally segregated from mining laws
Clark County	N-1575a	18,030	Agricultural Land Laws, R.S. 2455, P.L. 88-608 and exchange
		16,210	Additionally segregated from the mining laws.
Spring Mountain	N-257	809,361	Agricultural Land Laws, R.S. 2455, P.L. 88-608
		98,000	Additionally segregated from the mining laws
Spring Mountain	N-257b	41,800	Agricultural Land Laws, R.S. 2455, P.L. 88-608
		2,020	Additionally segregated from the mining laws
Total acres in planning unit classified for multiple use management:			2,134,351 acres
Total acres additionally segregated from mining location:			116,770

TABLE .41-11
Stateline Planning Unit

DESIGNATED AREAS

<u>Name of Area</u>	<u>Acres</u>	<u>Date</u>	<u>Purpose of Designation</u>
Red Rock Canyon	61,881	11-5-67	National Recreation Lands (recreation, wildlife, archaeological values)
Highland Range Crucial Bighorn Sheep Habitat	25,280	9-25-70	Protection of Habitat to maintain a desert bighorn sheep herd
Las Vegas Dunes Recreation Lands	3,360 (SLRA) 5,640 (VVRA)	9-25-70	Establishment of an off-road vehicle use area.
Sunrise Mountain Natural Area	3,520 (SLRA) 6,720 (VVRA)	9-25-70	Preserve unique biological, and aesthetic values.

Table .41-12 lists these major withdrawals.

An ongoing withdrawal review program is currently underway within BLM and Las Vegas District. Table .41-13 shows additional withdrawals. These withdrawals are listed by agency, BLM serial number, and type of withdrawal or its purpose. Details concerning an individual withdrawal can be found within the referenced BLM case file. All withdrawals will require BLM review under P.L. 94-579 (FLPMA) before 1991.

TABLE .41-12
Stateline Planning Unit

MAJOR WITHDRAWALS

<u>Agency</u>	<u>Acres Withdrawn</u>
Department of Interior (National Park Service)	230,049 (Lake Mead)
Department of Agriculture (U.S. Forest Service)	56,600
Department of Defense	23,414
Department of Interior (Bureau of Reclamation)	20,051
Department of Interior (Bureau of Indian Affairs)	3,420

TABLE .41-13
Clark County

OTHER WITHDRAWALS

<u>Agency</u>	<u>Serial Number</u>	<u>Type of Withdrawal</u>
Water & Power Resource Service	Nev-067001	Reclamation
FAA	Nev-059256	Air Navigation Facility
USFS	Nev-061774	Administrative Site
USAF	Nev-051795	Military
Army Corps of Engineers	Nev-013137	Military
USFS	Nev-028474	Recreation
U.S. Army	Nev-051790	Military
A.E.C.	Nev-2385	Research
National Park Service	Nev-058552	Administrative Site
Water & Power Resource Service	Nev-051745	Reclamation
Federal Power Commission	Nev-054523	Powersite
Department of Interior	Nev-047451	Water Reserve
BLM	Nev-058522	Administrative Site
BLM	Nev-065360	Protective
BLM (Eldorado Act)	Nev-048100	Bill to Convey
BLM (Fort Mohave Act)	Nev-055704	Bill to Convey
Army Corps of Engineers	Nev-054510	Military

6. Leases and Permits

A small number of long-term small tract leases are still in effect in some areas, especially near the Las Vegas Valley. These leases will be subject to sale under FLPMA upon termination.

Other than R&PP leases, no leases or permits are outstanding in the planning unit.

7. Unauthorized Use

Unauthorized dumping on public land is a significant trespass problem not only within the planning unit, but district-wide. With development of private lands, the nearby public lands become convenient areas for illegal dumping.

The District is presently confronted with Clark County Ordinance 9.04 which requires land owners to clean up their property to particular standards under penalty of law. Although the regional BLM Solicitor has advised the Las Vegas District that the ordinance is not applicable to BLM administered public lands, nevertheless, the problem has not been solved. Irrate private land owners are protesting such conditions on adjoining lands, and expecting the BLM to take necessary steps to remedy the situation.

At the present time the District can only act upon complaints, due to lack of financial resources and manpower. In order to mitigate the problem the District will have to institute an aggressive, full-time trespass program involving inventories and clean-up operations.

Mining claim occupancy trespass has become a significant problem on the District, particularly in the Stateline Planning Unit. Unfortunately, the need for full validity examinations and other statutory and legal requirements involve more money and manpower than is now available to pursue this management problem.

There are several other small trespasses, such as unauthorized occupancies or rights-of-way, that are discovered from time to time. These are generally minor in nature and do not constitute a serious problem.

8. Land Surface Quality

Indiscriminate dumping, abandoned mine shafts, and sand and gravel operations are the major contributors to reduced land surface quality in the planning unit. See Section .47D, Visual Resource Management, for detailed information on land surface quality.

9. Water Needs

No federally owned waters are being taken from public lands within the planning unit for private commercial use or to supply domestic water for community or industrial use. However, minor spring, well, and guzzler (rainwater collector) developments have been constructed on public lands in support of livestock, grazing wildlife, and other approved programs. See Section .45, Watershed, and Section .35, Water Resources, for detailed water availability and use information.

Las Vegas Valley Sub-Unit

Overlays

A separate base map and five overlays have been prepared for the Las Vegas Valley Sub-Unit.

Existing Land Use - shows rural and urban residential, commercial, industrial, resort and highway frontage, and public facility areas.

Clark County 1979 Zoning - shows zoning in the Las Vegas Valley as of December 31, 1979.

Rights-of-Way - shows powerlines of 69 kv or greater, natural gas and water pipelines, and communication sites.

Public Purpose - shows existing public purpose areas, including parks, and opportunities for public purpose uses, including school sites.

Development Constraints and Disposal Opportunities - shows flood hazard areas, unacceptable noise contours, and sewer areas; shows opportunities for disposals for specific uses.

1. Land Ownership

The Las Vegas metropolitan area is the economic base and center of population in Clark County. The cities of Las Vegas, North Las Vegas, and Henderson, and the urbanized unincorporated areas, being the townships of East Las Vegas, Paradise, Sunrise Manor, Enterprise, and Winchester, comprise the principal developments in the Valley. The primary urban area within the Valley extends about 23 miles from east to west and about 26 miles from north to south, with an overall area of about 598 square miles. The Las Vegas Valley Sub-Unit evaluated in this discussion corresponds to the planning unit recognized by the Clark County Department of Comprehensive Planning. The Sub-Unit contains 382,661 acres, of which BLM administers 134,700 acres or 35%.

The ownership pattern in the Valley is quite broken, with many 2.5 and 5 acre tracts still in BLM ownership scattered among private lands in the fringe, suburban areas surrounding the urban center. Many of these areas are being developed today to provide residential developments and other facilities necessary for the rapidly increasing population. Because of the ownership pattern, there are many developing areas in which "islands" of BLM lands are situated, which are remnant of disposal actions taken under the Small Tract Act. Such disposals were made in large numbers during the 1950s and early 1960s until it was determined that the

resulting land pattern had an adverse effect on planning efforts and future development of the Valley. Acres of public and private land in the Sub-Unit are detailed in Table .41-2. Also refer to the Existing Land Use Overlay.

Significance of Land Ownership Pattern: The public lands within the Las Vegas Valley Sub-Unit consist of scattered tracts which cannot be managed effectively under existing BLM programs (range, watershed, wildlife, recreation, lands, and minerals) due to incompatible land uses on adjoining private lands, which are primarily used for residential, commercial, and industrial purposes.

Random development throughout the Sub-Unit requires a variety of services such as powerlines, telephone lines, water lines, roads and other facilities. Due to the segmented land patterns of private and public lands, the BLM is continually receiving right-of-way applications for these facilities. Processing these applications is not only expensive, but management is also limited since random development does not permit these facilities to be channeled through designated corridors.

Another land use problem associated with scattered development of private lands, is that public lands have become convenient areas for unauthorized dumping.

2. Current Land Use

Urban-Suburban: The Las Vegas metropolitan area includes the bulk of all residential, commercial, and industrial lands in the county. The existing land uses are delineated on the Existing Land Use Overlay.

Casinos, hotels, and other related entertainment facilities are the major commercial enterprises in this area. Other commercial businesses located within this metropolitan area include general merchandise shops, wholesale and retail establishments, restaurants, and many other small businesses that offer goods and services to the resident population and vacationing tourists.

At the present time heavy industry in this area is limited to the city of Henderson. The industrial complex in the Henderson area includes such companies as Titanium Metals, American Potash, U.S. Lime, Stauffer Chemical, and Montrose Chemical. Light support manufacturing industries are located throughout the Las Vegas metropolitan area and include machine shops, bottling companies, electroplating shops, and a variety of other small industries. ~

Table .41-14 shows the acreage breakdown for the major types of land use in the Sub-Unit. Figures are from the Clark County

TABLE .41-14
Las Vegas Valley Sub-Unit

URBAN-SUBURBAN LAND USE

<u>Type of Use</u>	<u>Acres</u>
Residential	31,502.91
Commercial	3,200.77
Industrial	4,201.44
Public Facilities	11,049.62
Resort and Hotel	1,901.29
Total Developed Acreage	51,856.03

*** An opportunity exists to dispose of scattered and isolated tracts of public lands in and near the Las Vegas urban/suburban area. Such disposal would serve the dual purpose of providing land for urban/suburban expansion, while removing from Federal ownership scattered and isolated parcels of land which are not suitable for inclusion in BLM resource management programs, and which are excessively difficult and expensive to administer.

Livestock grazing directly conflicts with urban growth in the Las Vegas Valley. The population of the urban area of the valley (including Boulder City) nearly doubled to more than 455,000 persons between 1970 and 1980. Housing units did double, from 91,477 in 1970 to 187,538 in 1980 (U.S. Department of Commerce 1980). The growth has been primarily horizontal, resulting in urban sprawl throughout the valley. A planning assumption by local agencies is that the population will probably double again by the turn of the century.

At present, the Las Vegas Valley is conveniently defined, for range purposes, by the boundaries of the following allotments or other Federal withdrawals, beginning in the northeast and moving clockwise: Dry Lake, Muddy Mountains, Lake Mead National Recreation Area vicinity of Las Vegas Wash and River Mountains, Ireteba Peaks, McCullough Mountains, Hidden Valley, Spring Mountain, Kyle Canyon (and Lucky Strike), and the Desert National Wildlife Range. Within this area, livestock grazing would entail numerous conflicts with vehicles, urban recreationists, private homesites and such urban-related activities as construction and mineral sales.

Given the checkerboard pattern of public and private land ownership, proper fencing would be impractical. Waters could be difficult to develop as the valley is closed to further agricultural appropriation and most existing waters are dedicated to municipal or domestic use.

Livestock droppings would contribute to further pollution of runoff waters in the valley through coliform bacteria, thus contributing to health hazards in the valley.

*** An opportunity exists to withdraw the Las Vegas Valley (to include the Sunrise Mountain allotment), as defined above, from livestock grazing. A formal closure should be instituted through a Federal Register notice.

Consultations with the various local planning agencies have pointed out the desirability of disposing of lands first in areas already serviced by sewer and water facilities. In any event, all disposals should be undertaken in cooperation with local planning authorities to assure adequate zoning, hazard identification, and recreation and public purpose facilities. See the Development Constraints and Disposal Opportunities Overlay. This overlay also shows development constraints, such as areas not yet receiving sewer service.

In addition, an expression of interest has been received from the City of Henderson, requesting disposal by BLM of lands on the eastern side of the city, to be included within the incorporated city limits. Legislation is pending to transfer these lands to Henderson.

Legislation has been passed in U.S. Congress (PL 96-586, Santini/Burton, signed December 23, 1980) which provides for special revenue dispersal of proceeds from the sale of public lands in certain areas of the Sub-Unit. Under these special terms, resulting revenues would be dispersed in part to state and local governments.

Agricultural: There is some agricultural use of private lands on the eastern side of the Sub-Unit, adjoining the Advanced Wastewater Treatment plant near Henderson. Water is derived from sewage effluent and some wells. According to the State Water Engineer, however, there is not enough additional water available to consider using public lands for this purpose at this time.

There is no real potential for developing agricultural lands within the Las Vegas Valley. This Valley has been designated a closed groundwater basin by the Division of Water Resources, State of Nevada, and is closed to further appropriation for irrigation.

Public Purposes:

Recreation: The State Comprehensive Outdoor Recreation Plan (SCORP) has documented Clark County as an area where demand

for recreation facilities far exceeds supply. Summer campsites and day use areas with shade and water are in high demand. The Sunrise Mountain Natural Area, Las Vegas Wash, Senator Floyd R. Lamb State Park, and the Lake Mead National Recreation Area are the most noteworthy recreation areas within the Las Vegas Valley Sub-Unit.

Sunrise Mountain Natural Area: This area has been identified as having unique geologic, biologic, and aesthetic values and has been designated as a Natural Area (CFR 2071.1).

Las Vegas Wash: On the eastern outskirts of Las Vegas lies a unique strip of wetlands with a diversity of botanical and wildlife features. During the course of the year thousands of people go to this wetland to walk, picnic, study, fish or to enjoy the peace and quiet. School and university groups are currently using Las Vegas Wash as an ecological study area, and for archeological studies.

Senator Floyd R. Lamb State Park (Tule Springs): The park is located approximately 8 miles north of the city just off U.S. Highway 95. Visitors are attracted to the park by its proximity to Las Vegas, as well as by the tree-lined small lakes that offer cool shade. The state is planning future expansion of day-use areas already in existence and has set aside part of the site for potential reestablishment and expansion of a county-owned zoo facility.

*** An opportunity exists to lease lands to the state for the expansion of Floyd R. Lamb State Park. Under State Senate Bill 314, the State Land Registrar may acquire on behalf of the administrator of the state park system the following land formerly leased to the City of Las Vegas from the BLM in connection with the Tule Springs Park: R&PP Lease N-1327, covering Section 2, T.19., R.60E.; R&PP Lease N-1328, covering 561.21 acres in sections 3 & 4, T.19S., R.60E.; R&PP Lease N-1329, covering 160 acres more or less, located in section 11, T.19S., R.60E. These lands would be utilized by the state for the enhancement of the recreation values at Tule Springs. See the Public Purpose Overlay.

Lake Mead National Recreation Area: Refer to the Public Purposes Section of the Stateline Planning Unit for information, and to Section .47A, Recreation.

Community Facilities: In addition to the major recreation areas within the Las Vegas Valley Sub-Unit there are numerous other recreation facilities in the Las Vegas area. These facilities are operated by Clark County and the cities of Las Vegas, North Las Vegas, and Henderson, and include neighborhood parks, community centers, public golf courses, etc. Major urban parks are shown on the Public Purpose Overlay.

Clark County has submitted an expression of interest for certain lands outlined on the Public Purpose Overlay. These lands would be developed by Clark County for recreation purposes. An opportunity exists to transfer these lands to the county under the R&PP Act.

School Sites: Public primary and secondary education within the Sub-Unit is the responsibility of the Clark County School District. The District operates numerous elementary, junior high, and highschools, as well as various administrative facilities within the Las Vegas area. Many of these facilities occupy lands leased or patented under the R&PP Act. In addition, the School District currently holds R&PP leases and/or patents to a large number of tracts which have not yet been developed.

Due to the random growth patterns common in the Las Vegas Valley, the need for school sites does not always occur in areas where the District has already obtained sites. As a result, there will no doubt be a continued need for public lands for school sites in this area.

The School District has expressed interest in acquiring lands in a number of sections located in the fringes of the urban area. The School District projects a need for approximately 40 acres to fulfill the educational needs of the population within each fully developed section (640 acres).

*** The opportunity exists to set aside up to 40 acres of public lands within each section slated for disposal, to accommodate School District needs. Close coordination with the Clark County School District prior to all public sales in the Las Vegas area could prevent any use conflicts or shortage of lands for educational purposes.

Specific proposed school sites are shown within the area encompassed by the pending Santini-Burton Bill. In the more remote areas, entire sections are noted in which the school district envisions a potential for school sites in the future.

Wastewater Treatment Facilities: The major wastewater treatment facilities all provide secondary treatment. Three of the facilities (City of Las Vegas, Clark County Sanitation District No. 1, and Henderson No. 2), are secondary trickling filters and one (Henderson No. 1) consists of Imhoff tanks and oxidation ponds. All other facilities consist of sewage lagoon evaporation systems. See the Public Purpose Overlay.

Clark County has completed construction of an Advanced Wastewater Treatment Facility (AWT) which is required to meet strict water quality standards for Las Vegas Wash and Lake Mead. This facility has the capacity to treat 90 million gallons of wastewater per day.

When the Advanced Wastewater Treatment facilities were designed no one foresaw the magnitude of possible odors emanating from the plant and the problems these odors might cause. Residential development now surrounds the AWT plant and is moving toward the Sanitation District property line. Since this sewage plant emits odors, residents have been registering several major complaints with the Clark County Commission.

The Clark County Sanitation District has submitted an expression of interest to acquire an additional 220 acres of public land from the BLM for a buffer zone. An opportunity exists to assist Clark County in acquiring this buffer zone to be a safety area and to preclude advancing future developments from encroaching into areas where potential odors would be incompatible with land use in the immediate vicinity of the AWT plant. See the Public Purpose Overlay.

Flood Control: The major floodplain channels within the Las Vegas Valley Sub-Unit are outlined on the Development Constraints and Disposal Opportunities Overlay. Flooding occurs frequently in the Las Vegas Valley during periods of intense rainfall. Damage from floods can be quite significant unless some protective measures are taken, such as flood control channels or retention dams.

The City of Las Vegas is presently conducting a study for the construction of retention dams on the western boundary of the incorporated areas of the city. These retention dams would be designed to contain flood waters during intense rainstorms. Thus these dams would afford home owners in this area some protection from flood damage.

Transportation and Rights-of-Way:

Roads and Highways: The Las Vegas metropolitan area is served by three major highways--Interstate Highway 15 and U.S. Highways 95 and 93. From Las Vegas, Los Angeles is 282 miles southwest via I-15; Reno is 447 miles north via U.S. 95; and Phoenix is 285 miles southwest via U.S. 93. State Highways 16, 39, and 41 are major transportation routes within the Las Vegas Valley Sub-Unit.

Railroads: The railroad has played a major role in the development and growth of Las Vegas. In 1905, Union Pacific (Los Angeles, Salt Lake, San Pedro) Railroad made Las Vegas a major division point, and Las Vegas remains a principal terminal for the east-west flow of cargo. Freight can also be transferred at Henderson and Arden.

Airports: The three airports within the Sub-Unit which offer services to the public are McCarran International Airport, North Las Vegas Air Terminal, and Sky Harbor Airport. Commercial air travel to Las Vegas began in 1926, when Western Air Express, now Western Airlines, initiated the first scheduled flight from Los Angeles to Salt Lake City via Las Vegas. McCarran International Airport has remained among the 20 busiest airports in the nation over the past several years. The airport also provides general aviation services, consisting of a high proportion of itinerant operations. This reflects the fact that a large portion of the traffic is made up of tourists destined for Las Vegas entertainment facilities.

The North Las Vegas Air Terminal provides general aviation services. The terminal has a Federal Aviation Administration tower, three schools, an airplane sales department, and a repair shop. This airport, which is privately owned, has been receiving more and more general aviation traffic.

Existing airports in the Sub-Unit cannot accommodate enough of the traffic to eliminate the congestion at McCarran. Clark County, recognizing that the existing airports in the county will not be satisfactory substitutes for McCarran in their present form, commissioned a general site selection study. Based on the site selection study, Sky Harbor's capability could be improved to meet the general criteria set for utility airports by the FAA.

The proposed airport would consist of two parallel 5,000-foot runways and one 5,000-foot crosswind runway. The area within the property lines should be at least 315 acres. See the Public Purpose Overlay which depicts the proposed *** airport expansion, clear zones, and noise levels. An

opportunity exists for BLM to assist in this project when contacted by the county.

Communication Sites: There are four major elevated communication sites within the Las Vegas Valley Sub-Unit. These sites are located on Frenchman Mountain, the east side of the Sheep Mountain Range, and on the lower end of the Arrow Canyon Range. All of the sites outlined in Table .41-15 have access and power. See the Rights-of-Way Overlay.

TABLE .41-15
Las Vegas Valley Sub-Unit

EXISTING COMMUNICATION SITES

<u>Location</u>	<u>Number of Sites</u>	<u>Number of Users</u>
Frenchman Mountain (T.21S., R.62E.)	1	4
Sheep Mountain Range (Apex) (T.19S., R.63E.)	1	8
Arrow Canyon Range (T.19S., R.63E.)	2	3

Electrical Power Service: Nevada Power Company furnishes electric power to the cities of Las Vegas and North Las Vegas, and in the unincorporated areas of the Sub-Unit. California-Pacific Utilities Company furnishes the city of Henderson with electric power. The Rights-of-Way Overlay shows only those transmission lines within the Las Vegas Valley Sub-Unit that are 69 kv or larger (nominal voltage).

Telephone Service: Central Telephone Company provides all of the telephone service to the Las Vegas metropolitan area.

Water Service: Water for the area is obtained from wells within the Valley and from Lake Mead. Well water is distributed by the Las Vegas Valley Water District and a small number of private water companies in the outlying areas. The cities of Henderson and North Las Vegas provide water service within their respective incorporated boundaries.

Water from Lake Mead is delivered to Las Vegas by the Southern Nevada Water Project. Refer to the Rights-of-Way Overlay for the location of these lines.

Natural Gas Service: Southwest Gas Corporation provides the major portion of natural gas to customers within the Las Vegas metropolitan area. California-Pacific Utilities Company provides natural gas to the city of Henderson. Natural gas is provided to these companies by El Paso Natural Gas Company from its pipeline near Topcock, Arizona. Refer to the Rights-of-Way Overlay for the location of these lines.

*** The opportunity exists to continue to grant needed rights-of-way across public lands within the Las Vegas Valley Sub-Unit to accommodate the various utility and transportation facilities necessary for urban expansion. The rights-of-way should be granted in coordination with local planning agencies. For planning purposes, the entire Las Vegas Valley Sub-Unit should be considered a corridor.

3. Planning and Zoning

The entire Las Vegas Valley Sub-Unit has been zoned, either by Clark County or by the incorporated cities for areas within their authority. Current zoning for the Sub-Unit is shown on the Clark County 1979 Zoning Overlay.

The effectiveness of planning and zoning is difficult to assess. Although the county and all of the large communities have prepared general plans, the rapid influx of people into the area has made it difficult to keep such plans up-to-date. The pressures placed on the local governing bodies to allow uses not in accordance with existing plans or to have zoning modified to suit their needs are a constant problem.

4. Land Classification and Designation

A majority of the public lands in the Sub-Unit are classified for small tract disposal. This was done when a great many disposals were being made under that authority. Although the Small Tract Act was repealed, the classifications have been allowed to remain, because a more suitable classification has not been determined except in instances where particular parcels were needed for public purposes or where they were determined to be suited for public sale. Although no longer a valid classification, classifications must be removed by formal decision. This has not been done, partly because this classification segregates lands from some locations and entries. In addition, the withdrawal review process may eliminate some of the classifications.

There are several areas that have been classified for R&PP, which was done to hold lands that local governmental agencies had indicated an interest in acquiring for public purposes. During the tenure of the C&MU Act, some lands in the Sub-Unit were classified for multiple use management for the same reason. Also, a few parcels of land are classified for exchange. These were originally made in order to aid BLM programs and to aid other Federal agencies (NPS, USFS, etc.), in obtaining lands that were needed for their programs.

Due to the extremely small size of many of these classified lands (2.5 acres and smaller), the diversity of classification types, and the mixed ownership pattern, a detailed classification overlay has not been prepared. The Master Title Plat (MTPs) maps on file in the Las Vegas District office are accurate, detailed, and constantly updated. They are by far the best source of information available regarding classification of individual parcels. Along with the MTPs are historical index cards which allow the full history of public lands to be traced, including classification orders, applications, entries, and other information, small portions of which would make an overlay cluttered and unreadable.

5. Land Withdrawals

The only significant withdrawals of public lands within the Las Vegas Valley Sub-Unit have been for military purposes. Specifically, these withdrawals have been in support of Nellis Air force Base and its annex, formerly the Lake Mead Naval Base. Nellis Air Force Base is shown on the Existing Land Use Overlay.

6. Leases and Permits

Other than R&PP leases, discussed earlier, no active leasing program has been initiated under the Lands Program. Some previously granted small tract leases are still in effect, though management opportunities on these parcels are very limited. Leases for grazing, minerals, and other purposes are discussed in the particular URA section prepared for the resource involved. Permits for use are Temporary Use Permits (TUP) and are granted for incidental uses of less than twelve months.

7. Unauthorized Use

Unauthorized use on public lands within the Sub-Unit consists primarily of unauthorized dumping. This occurs throughout the Sub-Unit and the magnitude of the problem is so great that BLM can only take actions upon complaints by local officials and private citizens.

To a lesser extent other trespass problems involve unauthorized advertising signs, occupancy, and unauthorized rights-of-way.

8. Land Surface Quality

Major pollution sources in the Sub-Unit are water pollution in the Las Vegas Wash and unauthorized dumps. See Section .47D, Visual Resource Management, for more specific information on surface quality.

9. Water Needs

No Federally owned waters are being taken from public lands for land use in the Sub-Unit.

Sufficient water has long been a problem for Las Vegas. Projections from various planning agencies, including the Las Vegas Valley Water District, place an upward limit of 1,000,000 as the maximum population which could be supported in the area utilizing known water reserves and technology.

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.42 Minerals

Overlays

Four overlays have been prepared for each planning unit.

Mineral Status - shows right-of-way material sites, BLM community pits and contract sales, Federal Mineral ownership and partial ownership, and the areas of special act leasable minerals.

Locatable Minerals - shows mineral areas and mining districts where locatable minerals have been known or are expected to be found.

Leasable and Salable Minerals - shows mineral areas where leasable and salable minerals have been known or are expected to be found.

Geophysical Activity - shows geophysical exploration lines and unit agreements.

Mining districts and mineral areas are identified with an overlay key number. This number indicates whether the primary minerals in the district are locatable (L), leasable (LS), or salable (S). The districts are numbered consecutively for the entire county: Virgin Valley Planning Unit, numbers 1 through 16; and Stateline Planning Unit, numbers 17 through 53.

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Tabulations of production statistics are included for several mining districts and mineral areas. These tables are not numbered, but may be found within or immediately following the analysis of each area.

A. General Information

1. Mineral Resource Categories

Mineral resources and reserves within Clark County are subdivided into the following headings: 1) Identified Economic Reserves; 2) Identified Subeconomic Resources; and 3) Undiscovered Resources.

Identified Economic Reserves: Identified economic reserves are specific bodies of mineralized material whose location, quality, and quantity are known from geological evidence supported by engineering measurements, and from which a usable mineral or energy source can be economically and legally extracted at the time the mineral resource inventory (MRI) is taken or updated. These comprise what is generally considered "ore," a mineral material that can be mined, processed, and marketed at a profit. These ores are divided into three categories: measured, indicated, and inferred.

Measured ore is ore for which tonnage is computed from dimensions revealed in outcrops, trenches, workings, and drill holes, and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurements are so closely spaced, and the geologic character is defined so well, that the size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to differ from the computed tonnage or grade by more than 20 per cent.

Indicated ore is ore for which tonnage and grade are computed partly from specific measurements, samples, or production data, and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling are too widely or otherwise inappropriately spaced to outline the ore completely or to establish its grade throughout.

Inferred ore is ore for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and for which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition for which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred ore should include a statement of the spacial limits within which the inferred ore may lie.

Information concerning these identified economic reserves is usually considered by mining companies to be highly confidential and is rarely available to the public, especially when the reserve is on private land. Even in the case of mining claims on public land, data on tonnage and grade of ore is available only in very general terms.

Identified-Subeconomic Resources: Identified subeconomic resources are potentially valuable deposits not currently mineable because of legal restraints, too low in grade, too far from market, too difficult or expensive to mine, etc. These are divided into two categories: paramarginal and submarginal.

Paramarginal-- just below the level for economic production, or are perhaps not available because of legal or political circumstances.

Submarginal--resources which would require a substantially higher market price (more than 1.5 times higher than the current price) or a major cost-reducing technical advance. Many properties in this category have been opened up, explored, and abandoned.

Undiscovered Resources: Undiscovered resources comprise unspecified bodies of mineral-bearing material surmised to exist on the basis of broad geologic knowledge and theory. This is perhaps the most important resource category, since these resources will provide for future needs as existing resources are depleted. By studying the occurrences and modes of genesis of the known economic mineral deposits of the world, certain generalities can be drawn as to what types of rock and what structural conditions appear to be favorable for the deposition of each mineral or group of minerals. While hard and fast rules cannot be drawn, and exceptions frequently occur, we can still determine where the most likely places are to look for minerals, and what areas will probably not be fruitful.

Undiscovered resources are divided into two types: hypothetical and speculative.

Hypothetical--undiscovered material which may be reasonably expected to exist in known mining districts, although not necessarily surrounding known mineral occurrences. They could be associated with the types of rocks and structures that are known to be producers of economic mineral resources in other places.

Speculative--minerals which may occur outside of known districts or other mineral occurrences.

2. History of Mining

The minerals of Clark County have been mined as long as man has inhabited the area. Indians mined turquoise deposits in the Crescent Peak District, as well as other minerals used for pottery making and pigments. Either the early Spanish or Mexicans began mining in the Nelson area prior to 1857, and the white settlers who followed them reopened many of the old workings.

Mormon settlers in the Las Vegas area opened the Potosi mine in 1857, a lead-zinc-silver producer and one of the earliest mines in the area. By 1912, most of the major mining districts had been organized. The 1860 to 1912 period was the peak time of hardrock mining in Clark County. Many of the now small towns were many times their present size and mineral production was high. As the rich ores were depleted, no major new deposits were discovered. Mining costs rose quickly. This area has been sporadically active with exploration since World War I. For data concerning each mining district's production please refer to the individual write-up.

3. General Geology as Related to Mineral Occurrence

Clark County is part of the Basin and Range Physiographic Province and has elongate north-south mountain ranges and valleys, which were formed by faulting during the Tertiary period. Most of the valleys have no outlet for runoff. Rainwater drains into these basins from the surrounding mountains and evaporates, forming playas on the valley floors. The sediments that have brought into and deposited in these valleys are derived locally from the surrounding mountains. Sand and gravel alluvial fans and sandy-silt lake sediments are the most common valley fills. Meadow Valley Wash, Muddy Creek, the Virgin River, and Las Vegas Wash are the only valleys that have exterior drainage. They converge with the Colorado River drainage system.

The rocks of Clark County record more than 600 million years of rock formation. The oldest of these (PreCambrian) are composed of granites, gneisses, schists, and other crystalline rocks.

A thick series of younger (Paleozoic) rocks covers much of the area. These rocks are mostly limestones and shales with some sandstones. These rocks are the most productive mineral-bearing rocks in the area.

The next younger series of rocks (Mesozoic) are mostly limestones and red sandstones. They contain some minerals but are not particularly good producers.

The youngest rocks found in the area (Cenozoic) are interbedded sandstones, shales and volcanic rocks. The perlite, bentonite, etc., found in the area are part of this sequence of rocks.

Several times in the past, the rocks of the Clark County area have been intruded by masses of molten (igneous) rock. These molten rocks brought with them quantities of mineral materials that were injected into the surrounding limestones and shales and formed ores. About 90% of the metallic mineral production in the area has been from limestones and shales that are in contact with or in proximity to the various bodies of igneous (granite, etc.) rocks that have now cooled and solidified.

The various nonmetallic minerals such as gypsum, perlite, etc., were produced either by evaporation of ancient seas (gypsum) or from volcanic eruptions (perlite, cinders, etc.).

Recent interest in this area by the petroleum industry has identified a zone of excellent potential for oil and gas accumulation. This is known as the "overthrust belt," stretching from Canada to Mexico. The fault structures as well as folding associated with the overthrusting creates excellent structural traps. Stratigraphic traps may exist, but generally are not visible from the surface.

4. Mining Entities

With the passage of the Federal Land Policy and Management Act in 1976, all mining claimants are required to file their claims with BLM. Detailed information is available at the Las Vegas District Office on microfiche; because over 5,000 claims have been recorded in Clark County since December 31, 1980, individual mining district and mineral area write-ups will not include this data and a discussion of companies and claimants currently active in each area will not appear.

B. Virgin Valley Planning Unit

1. Identified Economic Reserves

The following mineral areas are considered to have identified economic reserves:

Measured Reserves: Apex (Overlay Key No. L-1)
Muddy Mountains (Rainbow Gardens)
(L-3)
Valley of Fire-Overton (L-4)

Indicated Reserves: Tiffany-Crystal (L-2)

Inferred Reserves: Salt Lake Freeway (S-11)

Locatable: Economic reserves within the Virgin Valley Planning Unit are limited to gypsum, limestone, and silica sand at the present time. In order for limestone and silica sand to be locatable minerals (rather than salable), they must be of a high grade and have "special and distinct value." The limestone at Apex fits these criteria as a "chemical grade" (better than 95% CaCO_3) which is used for sugar refining, steel manufacturing, and lime products such as plaster and cement. Exploitation of high-purity silica sand at the Tiffany and Crystal quarries has not occurred since 1965, but economic production from the Vinnell quarry has been intermittent. Gypsum deposits in the Rainbow Gardens area are being mined by Johns-Manville and the facility includes a wallboard plant.

Leasable: The only leasable minerals currently mined in the planning unit are the silica sands in the Valley of Fire and Overton areas made leasable by Executive Order 5105.

Salable: Economic deposits in the planning unit have been lumped as the Salt Lake Freeway, Sunrise Mountains, and East Sunrise. The first two are sand and gravel, the mining of which is economical because of the nearness to the communities utilizing the materials, i.e., Las Vegas, Moapa Valley, and Mesquite. If the points of use were not very near the deposits, thus necessitating long hauls and therefore higher transportation costs, they would probably not be economically attractive.

2. Identified Subeconomic Resources

The following mineral areas are considered to have identified subeconomic resources:

Paramarginal: Bunkerville (Overlay Key No. L-5)
Gold Butte (L-6)
Overton Wash (LS-12)

Submarginal: White Basin (LS-10)
Toddy (L-7)
Muddy Mountains (North Muddy and Black
Mountains) (L-3)
Callville Wash (LS-15)

Locatable: Bunkerville and Gold Butte mining districts were active in the past and can be classified as paramarginal. Small operators in the Gold Butte district may have economical operations with the recent upward surge in metal prices, but there is no information available to verify this.

Gypsum in the North Muddy Mountains and bentonite at Toddy have been exploited in the past and can be classified as submarginal.

Leasable: Past mining and extraction of leasable minerals has occurred in White Basin (Overlay Key Number LS-10) and Callville Wash (LS-15), where borates were mined in the 1920s. Mining ceased because of competition from other sources and legal constraints. These areas have been classified as submarginal.

Leasable sand and gravel in the Overton Wash (LS-12) area is being utilized only by BLM community pits. While it is possible that these pits can be considered economic reserves, they are classified here as paramarginal.

Salable: It is possible that, as Las Vegas expands, those sand and gravel deposits identified as economic reserves may fall into this category in the future because of urban growth and associated political and legal restraints.

3. Undiscovered Resources

The following mineral areas are considered to have undiscovered resources:

Hypothetical: White Basin (Overlay Key No. LS-10)
East Overton (LS-13)
Colorock-Buffington Pockets (S-14)

Speculative: Lake Mead NRA (LS-16)
Overthrust Belt (entire county)
Unnamed (L-9)

Locatable: Undiscovered resources of locatable minerals may be surmised to exist around the mining districts. Typical exploration targets for hardrock minerals are granite intrusive rocks, known faults and fault inter-sections, alteration halos,

and other indicators detectable by geochemical or geophysical means. Undiscovered (hypothetical) locatable minerals can be expected to occur around the following additional districts and areas:

Apex--limestone (Overlay Key Number L-1)
Gold Butte--hardrock minerals (L-6)
Muddy Mountains (Rainbow Gardens)--gypsum (L-3)
Tiffany-Crystal--silica sand (L-2)

Leasable: Undiscovered leasable minerals may occur around the known occurrences of leasable minerals. Principal among these hypothetical deposits are those associated with borate mining in White Basin (LS-10) and Callville Wash (LS-15), not only for borates but also zeolites and sodium. Exploration for sodium is currently occurring in White Basin under several prospecting permits.

Extensions of possible mineral occurrences into Lake Mead National Recreation Area (LMNRA) (LS-16) have also been classified here, because minerals which are otherwise locatable are leasable on these National Park Service lands, such as those south of Gold Butte.

Oil and gas must, at this time, be considered undiscovered-speculative, although in the past several years there has been considerable interest by numerous companies in the oil and gas potential in the Nevada portion of the "overthrust belt." Since 1929, only ten wells have been drilled in the planning unit, with only one "show" reported. In 1980, Mobil Oil Company drilled a wildcat on Mormon Mesa. Results are unknown, except that commercial oil was not found. Chevron Oil Company plans to spud two wells, perhaps three, in the Muddy Mountains during 1981. The entire planning unit is classified as having potential value for oil and gas. For a more detailed account of oil and gas activity in Clark County, refer to the Oil and Gas discussion.

Salable: Virtually every intermontane valley within the planning unit is considered a speculative resource area for sand and gravel. An inventory of this resource has never been made, but one can logically expect the alluvial fans and valley fill in the intermontane basins to contain some usable material. Since no demand exists for these deposits, their quantity and quality have never been explored or determined, although sporadic use of this resource is made by the county and state highway departments for road construction and highway maintenance.

Other salable minerals, such as building stone, ornamental stone, and volcanic cinders, are not considered here. No inventory

exists, but it is highly likely that these materials could be found in many areas of the planning unit. Because these minerals cannot be economically transported very far, most cannot be considered of value unless there is a local market.

4. Mineral Resource Areas

Overlay Key Number

L-1	Apex
L-2	Tiffany - Crystal
L-3	Muddy Mountains (Black Mountains, North Muddy Mountains, Rainbow Gardens)
L-4	Valley of Fire - Overton
L-5	Bunkerville
L-6	Gold Butte
L-7	Toddy
L-9	Unnamed (Miscellaneous Prospect)
LS-10	White Basin
S-11	Salt Lake Freeway
LS-12	Overton Wash
LS-13	East Overton (Miscellaneous Prospect)
S-14	Colorock - Buffington Pockets (Miscellaneous Prospect)
LS-15	Callville Wash
LS-16	Lake Mead National Recreation Area

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1. Mineral Area: Apex (Arrolime)
T.18 & 19S., R.63E.
2. Economic Type: Identified Economic Reserve
(Subeconomic reserves and undiscovered resources
are also identified, south of the economic deposit.)
3. Commodity: Apex is the name of an old railroad station which is
located near the U.S. Lime Division of the Flintkote Company's plant
and mine. The plant is located to the southwest of Las Vegas along
a bypass section of Routes 91 and 93 (Salt Lake City Freeway).

This plant has been in operation for many years. The high purity limestone is mined at the site and much of it is also processed on site. The limestone is crushed, burned, and then used in a number of lime products such as plasters, cements, etc. The unprocessed material is shipped either to Utah where it is used by the Kaiser Steel Company as a flux in their Direct Oxidation Reduction steel plant, or to California where it is used to refine sugar. The carbon dioxide formed by the chemical breakdown of the limestone is used as a decoloring agent for the raw sugar. Any limestone used for such processing must meet U.S.F.D.A. standards for purity since the final product, in this case sugar, is for internal human use. This limestone meets those standards.

4. Geologic and Other Technical Data: The limestone being mined or
applied for, crops out as a series of north-south trending low hills
between the Dry Lake Range and the southern extension of the Arrow
Canyon Range.

The limestone that makes up the Crystal Pass Member of the Sultan Limestone of Devonian age is grey to black, fine-grained, and of high purity. At the mine site, this member is about 200 feet thick.

The Crystal Pass member strikes 50° northeast to southwest and dips 32° to the northwest. It is from 260 to 350 feet in thickness and conformably overlies the Valentine Dolomite.

The chemical composition of this limestone is as follows:

Si O ₂	0.60%
Fe ₂ O ₃	0.05%
Al ₂ O ₃	0.40%
MgCO ₃	0.90%
CaCO ₃	98.05%

Average analysis of the material under new patents (Midway claims, 3 miles south) is as follows:

SiO ₂	1.00%
R ₂ O ₃	0.35%
MgCO ₃	0.93%
CaCO ₃	97.72%

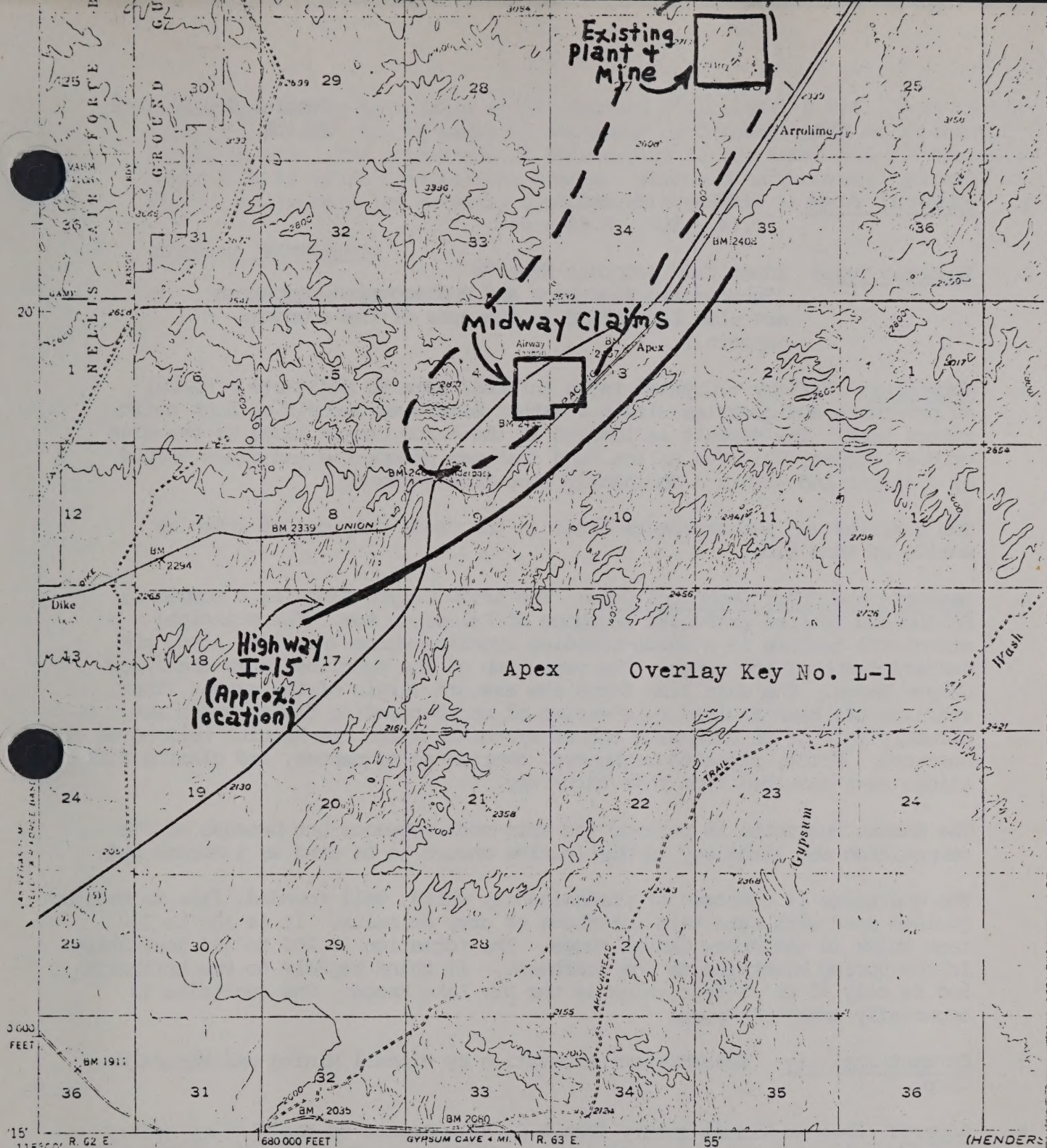
5. Current Activity: Active operations by Flintkote Company.
6. Access: By Old Salt Lake Highway (Routes 91 and 93).
7. Production Statistics: At the mine site, limestone is being mined at a rate of 500,000 tons per year.

In 1965 the gross sales of lime and lime products by the Flintkote Plant at Apex was \$1 million. The plant and facilities represent an investment of about \$4 million to which a new \$1.5 million washer is being added.

8. Selected References:

1. Mineral Patent Application N-2706.
2. Longwell et al. 1965.

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Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS

Topography from aerial photographs by multiplex methods
and by plane table survey, 1952. Aerial photographs taken 1950

Projection: 1927 North American datum
6,000-foot grid based on Nevada coordinate system, east zone

Dashed land lines indicate approximate locations

Certain land lines omitted because of insufficient data

One-meter Universal Transverse Mercator grid ticks,
11, shown in blue

Approx. 1952 MEAN
DECLINATION, 1952

THIS MAP COMPLIES WITH NAT.
FOR SALE BY U. S. GEOLOGICAL SURVEY, DEPT.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS

1. Mineral Area: Tiffany - Crystal
T.14 - 16S., R.63 - 64E.
2. Economic Type: Identified Economic Reserve
(Subeconomic resources and undiscovered resources
are also identified in the area of the economic
deposit.)
3. Commodity: Tiffany - Crystal is an informal name to designate a number
of prospects and quarries within a rather extensive deposit of high purity
silica sand. The deposit is located in the Arrow Canyon Range to the east
of U.S. Highway 93. The silica sand that was prospected and mined occurs
as a single bed within a dominantly limestone sequence.

Two quarries and two prospects exist in the area, only one of which is
active at this time.

4. Geologic and Other Technical Data: The Arrow Canyon Range is a complexly
folded and faulted carbonate sequence of Paleozoic Age. The principal
structural feature is a north-trending syncline whose axis lies along the
eastern flank of the range. The west limb of the syncline forms the Arrow
Canyon Range. The east limb forms the eastern margin of the range. This
syncline has been faulted by a series of north-trending faults which are
probably part of an extensive thrust system in which the hanging wall moved
eastward. Folds, repeated sequences, overturned sequences, and missing forma-
tions have resulted from this thrusting.

The Eureka Quartzite is part of the main rock sequence but because of its
composition and lithology is distinctive enough to be used as a marker bed.

The quartzite is composed of predominantly white, well-rounded, fine to medium-
grained sand with rare thin interbeds of grey dolomite. It is 100 to 140
feet thick in the Arrow Canyon Range. The formation is 200 to 350 feet thick
in the Spring Mountains to the southwest. It thins rapidly to the northeast
and is only 25 to 35 feet thick in the Dry Lake Range. The quartzite is
apparently extremely pure.

5. Current Activity: Intermittent excavation by Vinnell Mining and Minerals
Corp.
6. Access: Road to Vinnell quarry from U.S. 93. Access to the Tiffany quarry
and Crystal prospects is provided by roads from the Ute turnoff on Interstate 15.
7. Production Statistics: The formation has been prospected and/or mined at
several locations within the Arrow Canyon Range. The Crystal prospects are
located in Sections 4 and 29, T.15S., R.64E. They have no recorded production.

The Tiffany quarry is located in Section 13, T.15S., R.63E. It had an inter-
mittent production of about 2,000 tons of rock per year in 1954. It has not
been active since at least 1965.

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The Vinnel quarry is located in SE^o Section 27, T.15S., R.63E., just to the east of U.S. 93. Mining began in September or October, 1972 on unpatented mining claims. The production of this quarry is not known and the operation appears to be of an intermittent nature. Standard earthmoving equipment is being used to mine the material from the quarry face.

8. Selected References:

1. Longwell et al. 1965.

1. Mineral Area: Muddy Mountains Gypsum (Black Mountains, North Muddy Mountains, Rainbow Gardens)
T.14 - 23S., R.62 - 70E.
2. Economic Type: Identified Economic Reserve (Rainbow Gardens) -
Subeconomic - Submarginal (Black Mountains, North Muddy Mountains)
(Undiscovered resources are also identified in the area of the economic and subeconomic deposits.)
3. Commodity: The Sunrise, River, Black, Muddy, and North Muddy Mountains, and the Elack Ridge all have potential for gypsum. Gypsum has been reported throughout the area but only three locations have had any exploration. These are the Rainbow Gardens, Black Mountains, and North Muddy Mountains areas. Only the Rainbow Gardens area is currently producing. The White Star Mine in the North Muddy Mountains has been closed since 1933. The Black Mountains have not had any recorded production.
4. Geologic and Other Technical Data: The mountain ranges that comprise this area contain rocks that range in age from Precambrian to Quaternary. Gypsum occurs in the Permian red beds and the Kaibab, Callville, and Toroweap Formations, the Triassic Moenkopi and Chinle Formations, the Cretaceous (?) to Tertiary (?) Gale Hills and Thumb Formations, and the Tertiary Horse Spring and Muddy Creek Formations.

The gypsum ranges from low grade gypsite to massive beds that exceed 100 feet in thickness and are traceable for miles.

Black Mountains

T.10 - 21S., R.65 - 67E.

Thick beds of massive gypsum occur in the Tertiary Horse Spring Formation. There has been no development or production from these deposits.

Most of this area is within the Lake Mead National Recreation Area. All minerals, including gypsum, within the Lake Mead NRA were made leasable by the Act of October 8, 1964 (78 Stat. 1039; 16 USC 460 N). The conditions under which mining can occur in the area are contained in 43 CFR Subpart 3566.

North Muddy Mountains

T.15 & 16S., R.66 & 67E.

The North Muddy Mountains are a highly deformed mass of Paleozoic and Mesozoic rocks, many of which are steeply tilted or overturned. This deformation is related to the Glendale Thrust and Arrowhead fault.

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The gypsum occurs as extensive beds in the Permian red-bed series and in the Chinle Formation. One bed is reported to be 200 feet thick and traceable for 4.5 miles. Almost pure gypsum occurs as a 30 foot thick band in the bed.

Gypsum from the Permian rocks was mined at the White Star Mine. Two beds of gypsum were mined, one of which averaged 30 to 40 feet in thickness. The mine is a fairly old one, having been opened prior to 1922. In 1922 a production rate of 3,000 tons per month was recorded. The mine was closed in 1933.

The Anderson property is located in Section 6, T.16S., R.67E. Bedded gypsum averaging 30 feet thick occurs in the Chinle Formation. There has been no recorded production. Reserves in this deposit have been estimated at 1.5 million tons.

Other deposits are known to occur in T.15S., R.66E. One bed is reported to be 150 feet thick. The gypsum passes into anhydrite at depth. There has been no production.

Rainbow Gardens

T.19 - 21S., R.63 - 64E.

The Rainbow Gardens area is the only area that is currently producing. Gypsum has been mined in the area since 1938. The White Eagle Mine was opened by Pabco Products Inc., which operated the mine until 1956. The gypsum occurred in the Kaibab and Moenkopi Formations. Production is estimated at 100,000 tons per year prior to 1960. Operations were shifted in the late 1950's to a gypsum deposit which occurred in a member of the Thumb Formation. The mine was located in Section 4, T.20S., R.63E. Operations were again shifted, this time to the same formation but in Sections 16 and 21, T.21S., R.63E. Material from these mines was shipped to California for processing. Operations again shifted, this time to Sections 11 and 12, T.20S., R.63E., and Section 7, T.20S., R.64E. These operations include the Gypsum Cave Mine (Sec. 11, T.20S., R.63E). Originally operated by Pabco, they were taken over by the Fibreboard Company. Recently they became a Johns-Manville Company property. The operation now includes a washing plant and a gypsum wallboard plant in addition to the mine.

The Gypsum Cave Mine produced from lenses in the Muddy Creek Formation. There are no production estimates.

The Schumaker Mine is also in the Muddy Creek Formation. Annual production is over 100,000 tons per year. The material being mined is a selenite deposit developed in the Muddy Creek Formation by ascending ground water. There is about 30 feet of mineable gypsum in the central portion of the deposit.

An estimated 750 million tons of 80% or better gypsum can be mined from the area.

The low east-west hills to the west of Gypsum Cave have some potential. Small exposures are of good quality and may indicate more extensive deposits at depth. The gypsum occurs in Permian rocks mostly in the Callville Formation. The area has been heavily staked for gypsum on materials that range from late Paleozoic to Tertiary in age.

5. Current Activity: The Johns-Manville plant in Rainbow Gardens area is active.

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6. Access: There are roads into all of the areas mentioned. Access to Rainbow Gardens and Black Mountains is via Lake Mead National Recreation Area access road.
7. Production Statistics:

North Muddy Mountains

The White Star Mine recorded production of 3,000 tons per month in 1922.

Rainbow Gardens

The White Eagle Mine production is estimated at 100,000 tons per year prior to 1960, and the present Johns-Manville mine currently produces over 100,000 tons per year.

8. Selected References:

1. Longwell et al. 1965.
2. Olson, 1964.
3. 43 CFR Subpart 3566.
4. District Mineral T&R files.

1. Mineral Area: Valley of Fire - Overton
T.15 - 17S., R.66 - 68E.
2. Economic Type: Identified Economic Reserve
(Subeconomic resources are also identified in the
area of the economic deposit.)
3. Commodity: Mining of silica sand was begun in the area in 1927 utilizing
conventional quarrying methods. At least six open pits have been excavated
in the area. The materials are shipped after washing to Los Angeles which
absorbs most of the production. It is used in foundry work, glass, and
chemicals.

Both "hard rock" and blow sand derived from the old sandstone are being
mined. Both sources yield a similar product.

Executive Order 5105 withdrew the area from the location of silica sand
mining claims. Such materials were made leasable minerals by this order.

4. Geologic and Other Technical Data: The material being mined is the Base-
line Sandstone of Upper Cretaceous Age. Exposures of this sandstone are only
known to occur in the Valley of Fire - Overton area. A representative analysis
of this material is given in Longwell et al. (1965) as follows:

SiO	96.82%
Al O	1.79%
Fe O	0.07%
TiO	0.06%
MgO	0.13%
CaO	0.03%
Na O	0.19%
K2O	0.28%

P O, MnO, and S, were not determined.

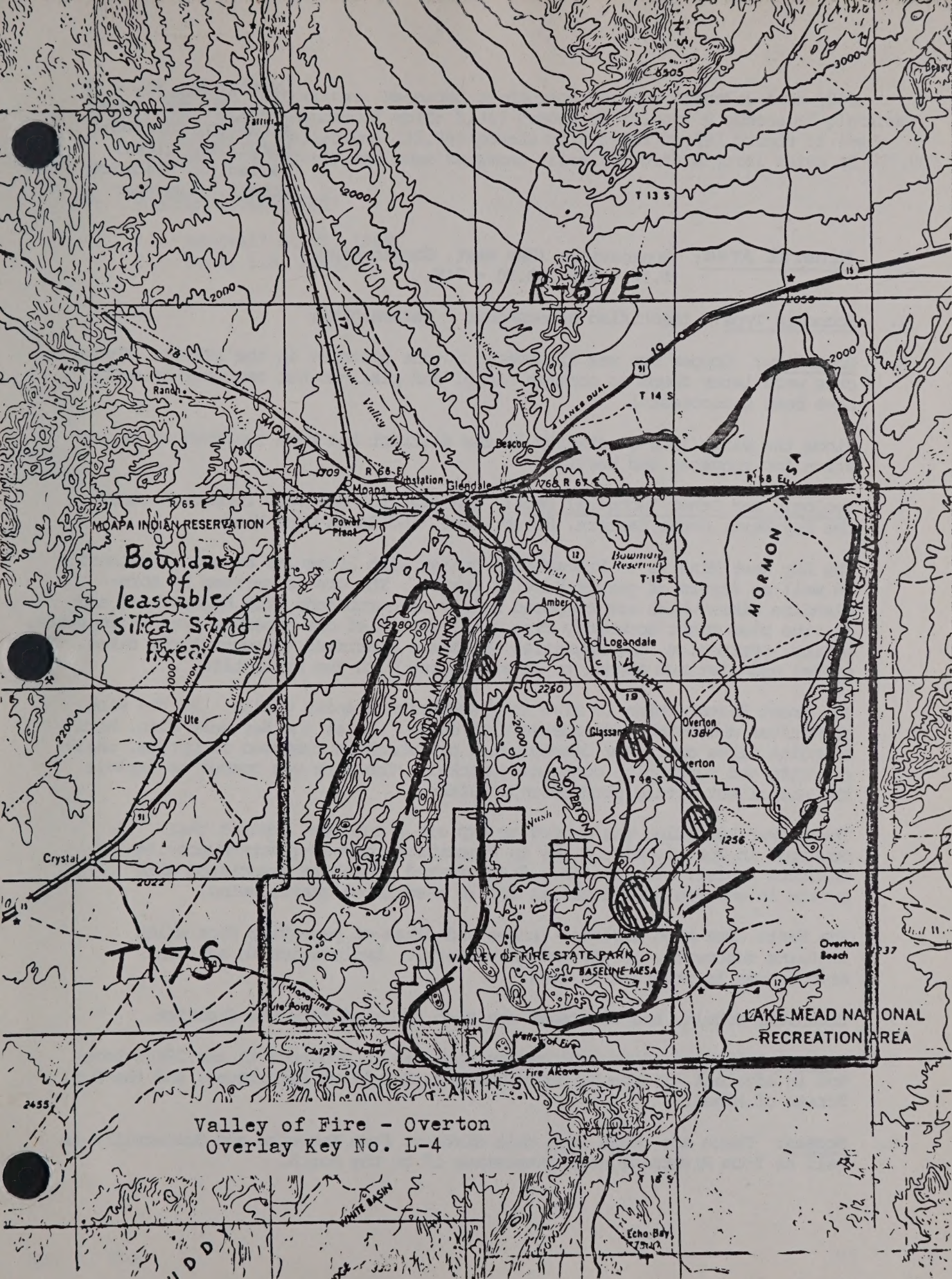
Use of this sand has been somewhat restricted because of the small grain
size of the material. The acceptance of such materials by the foundry and
glass industries has increased in recent years and the fineness of the
material is becoming less of a problem.

5. Current Activity: Two silica sand leases are currently in effect in this
area (refer to CC-021512 and Nev-044345). Considerable other mining activity
in the area is on private land, particularly by Simplot Silica.
6. Access: Access to most of the silica sand deposits is provided by any
of the numerous roads out of the Moapa Valley area.
7. Production Statistics: Annual production from the parent rock and eolian sand
derived from the Baseline sandstone is about 185,000 tons per year. At the
present rate of production the known reserves are expected to last for many
years.

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8. Selected References:

1. Longwell et al, 1965.
2. Las Vegas Review Journal, 1972.
3. 43 CFR Subpart 3563.



Overlay Key No. L -5
gold, silver, copper,
titanium, tungsten,
beryllium, nickel,
palladium, platinum,
cobalt, fluorspar

1. Mineral Area: Bunkerville (Key West, Copper King)
T.14 - 17S., R.70 - 71E.
2. Economic Type: Identified Subeconomic - Paramarginal
3. Commodity: Copper ore was discovered in the district in the 1890's. These ores were later found to contain nickel and platinum but recovery attempts have been unsuccessful.

Since the early 1960's activity in the district has been confined to exploration for tungsten and beryl.

4. Geologic and Other Technical Data: The district has four important mines, the Key West, Great Eastern, Silver Leaf, and Santa Cruz Mines.

The Key West Mine is in Precambrian gneiss with irregular masses of pegmatite as well as layers of garnet-biotite-schist. The ore is carried by hornblendite dikes which are composed mainly of hornblende with hypersthene and olivine plus minor accessory minerals. The chief ore minerals are chalcopyrite, pyrite, pyrrhotite, and magnetite which are scattered throughout the dikes. The nickel and platinum appear to be associated with the pyrrhotite.

The Great Eastern Mine is also in Precambrian granite gneiss. At the mine, pegmatites and hornblende gneiss also occur. As at the Key West Mine, hornblendite dikes carry the disseminated ore which is composed of pyrite, chalcopyrite and pyrrhotite containing nickel. The mine was opened to exploit the nickel but little production resulted.

The Silver Leaf Mine was opened to exploit a tungsten deposit that occurred in hornblendite dikes in Precambrian garnet-quartz-muscovite-chlorite schist. The ore is a disseminated scheelite associated with pyrite in sheared dike material and in associated quartz veins.

The Santa Cruz Mine explores lenses and dikes of pegmatite rock which contains muscovite, beryl, and chrysoberyl. Exploration in adjacent Arizona was in progress in 1964.

Titanium, cobalt, and fluorspar are also reported from the district.

5. Current Activity: Some exploration work was in progress in the 1960s here and in adjacent Arizona by Taglo Company, Beryllium Associates, and the U.S. Bureau of Mines.
6. Access: There are roads into this district from Mesquite and Bunkerville as well as from Riverside near Interstate 15 to the north.

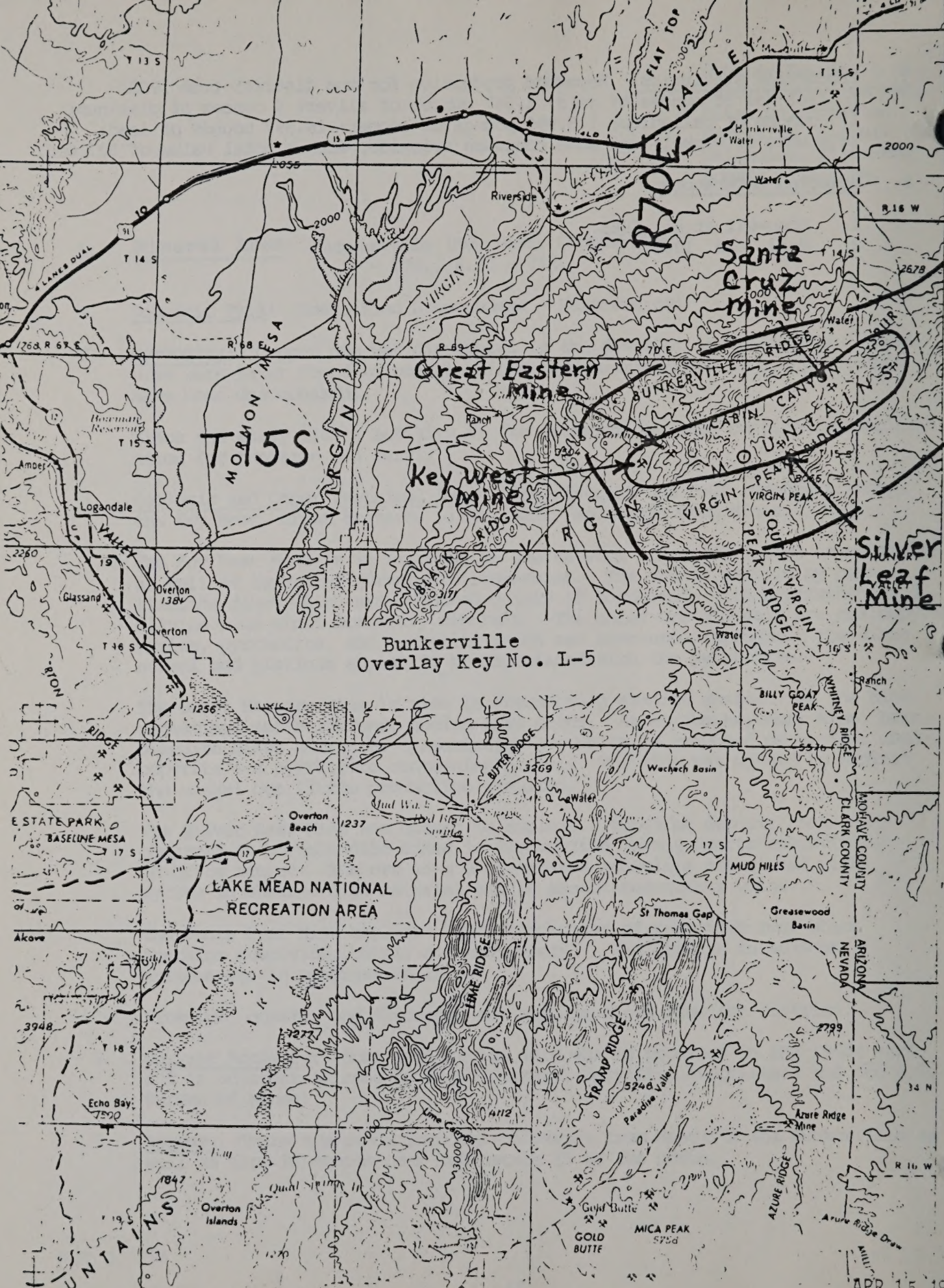
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7. Production Statistics: Recorded production for the district from 1908 to 1962 was 55 ounces of gold; 1,347 ounces of silver; 6 ounces of platinum; 177 ounces of palladium; 125,990 pounds of copper; 26,597 pounds of lead; 36 pounds of nickel; and some tungsten trioxide, with a total value of \$27,000.

8. Selected References:

1. Longwell et al. 1965.
2. Beal, L.H. 1965.

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Bunkerville
Overlay Key No. L-5

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Overlay Key No. L -6
gold, silver, lead,
zinc, copper, uranium,
thorium, tungsten, mica,
vermiculite, magnesite,
beryl, feldspar, monazite ?,
tantalum ?, antimony ?

1. Mineral Area: Gold Butte
T.17 - 21S., R.69 - 71E.
2. Economic Type: Identified Subeconomic - Paramarginal
(Undiscovered resources are also identified in the
area of the subeconomic deposits.)
3. Commodity: Mining began in the district in 1873 when mica and sheet mica
were discovered near Gold Butte. Between 1873 and 1908, about 5.5 tons of
mica were mined. The area has been mined more recently for vermiculite.
Metal mining began about 1905 and continued on an intermittent basis until
1941. Numerous independent claimants are active in the area, primarily
seeking gold.
4. Geologic and Other Technical Data: The district is divided by the Gold
Butte Fault into two provinces. The northern province which includes the Lime
and Tramp Ridges is composed of rocks that range in age from Precambrian to
Tertiary. The predominant rock types are Paleozoic carbonates, however.
Ores are confined to the Tramp Ridge.

South of the Gold Butte Fault, the rocks are predominantly Precambrian meta-
morphics that have been intruded by porphyritic granite of Precambrian age.

The Azure Ridge which occurs south of the fault is more typical of the northern
province in terms of rock types and mineralization.

Mineralization in carbonate rocks is restricted to the Tramp and Azure
Ridges, and is generally of replacement-type ores. In the southern province
gold is found in quartz veins associated with intrusive rocks.

The mica and beryl are associated with pegmatites found in these rocks,
and vermiculite is associated with intrusive ultra-basic rocks.

Uranium minerals are found in the Tertiary Horse Spring Formation along
the east side of Tramp Ridge.

Examples of the different types of deposits exploited are as follows:

Tramp Mine - The ore occurs as stringers of limonite containing
cuprite, malachite, and azurite in fractured Rogers Spring Lime-
stone. Only two small shipments were made.

Azure Ridge Mine - Ore occurred as lens-shaped replacement bodies
containing limonite with malachite, smithsonite, aurichalcite,
and copper silicates. The country rock was a limey dolomite.
Small shipments of zinc and copper ores were made in 1918.

Hilltop Mine - The mine explores a pegmatite-containing fluorite, epidote, clinozoisite, muscovite, biotite, magnetite, beryl, and the uranium-bearing mineral samarskite. Stibiotantalite and chlorite are also reported to occur. The quartz and feldspar are probably of commercial grade but have no ready market.

Marron Mine - This mine explores Precambrian mica schist cut by granitic dikes. Scheelite and powellite occur in joints and fractures near the dikes. No production is recorded.

Ole Mine - The mine explored the contact between sheared gneiss and schist and a biotite lamprophyre dike. This zone is reported to contain pyrite, chalcopryite, galena, and sphalerite. No recorded production.

Long Shot Mine - This mine is located in the freshwater limestones and tuffaceous and clastic sediments of the Horse Spring Formation. Small amounts of uranophane containing 2% U O occur. No recorded production.

Old Dad and Uranium #1 Mines - These mines explored pegmatites containing radioactive magnetite associated with monazite. No production recorded.

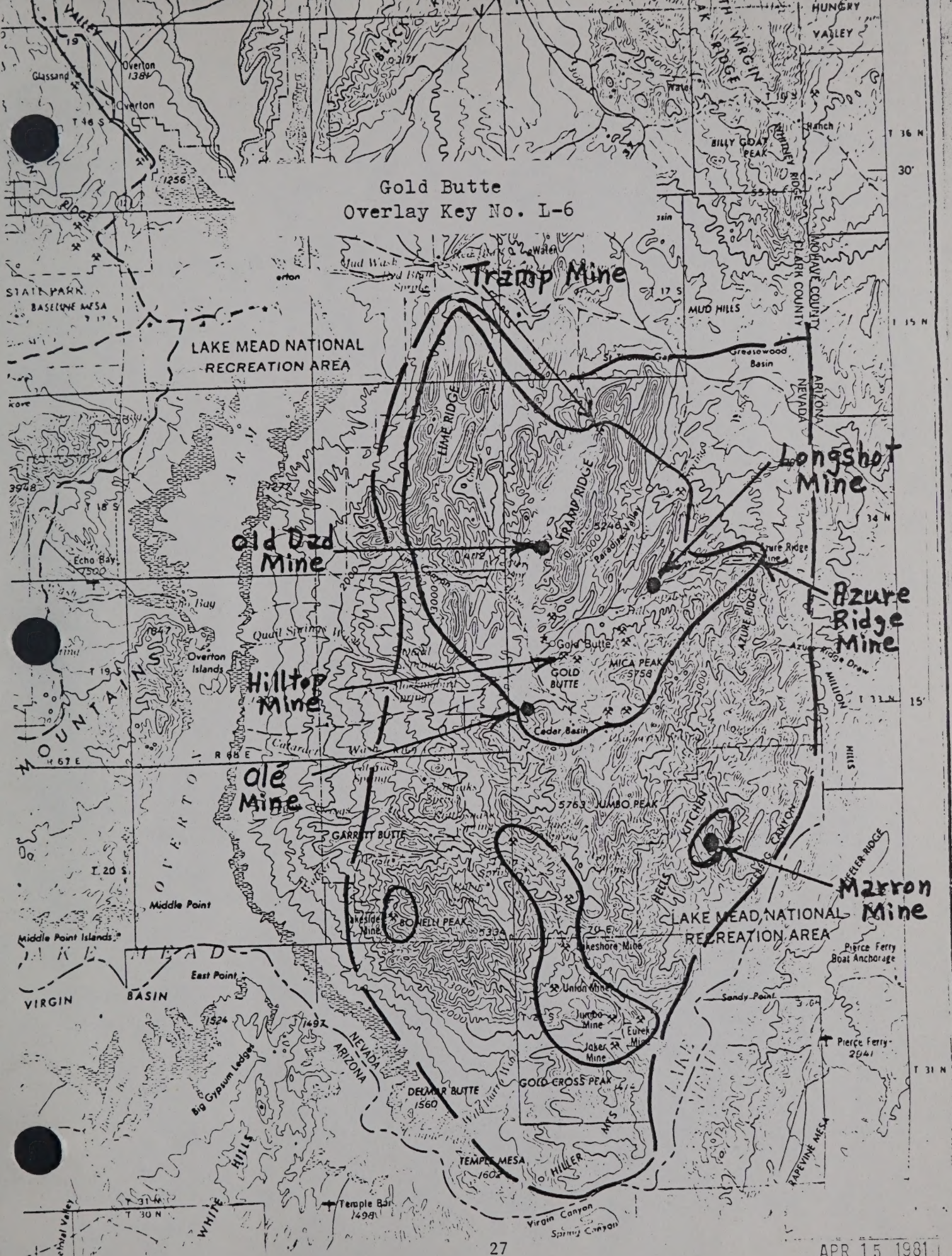
5. Current Activity: Small operators on mining claims in the Gold Butte area are common.
6. Access: Primary access to the Gold Butte area is provided by an unpaved road from Riverside on the Virgin River. There are numerous access roads within the Gold Butte area.
7. Production Statistics: Between 1873 and 1908, approximately 5.5 tons of mica were mined.

Gold production is estimated to be between \$40,000 and \$100,000 (\$35 per ounce). Small amounts of copper, lead, zinc, and silver were also produced.

8. Selected References:

1. Longwell et al. 1965.
2. Leighton, F.B. 1967.

Gold Butte
Overlay Key No. L-6



1. Mineral Area : Toddy
T.19S., R.64E.
2. Economic Type: Identified Subeconomic - Submarginal
3. Commodity: The Toddy claims and associated millsites were located for bentonite clay by the R.T. Vanderbilt Company, Inc. The clays being mined reportedly meet Federal Food and Drug Administration standards for internal consumption by humans. This clay and clay from four other deposits are blended and processed at Barstow, California. The processed material is then used as pill fillers, cream and lotion bases, and so on, in Connecticut.
4. Geologic and Other Technical Data: The material being mined is part of a bentonite bed probably within the Cretaceous or Tertiary Gale Hills Formation. The clay is a magnesium-rich bentonite. The material is hand-mined and hand-sorted. The clay meets or exceeds the following specifications for internal use:

Pb - less than 23 ppm
As - less than 16 ppm
Coliform bacteria - none
vegetative material - none
ph - neutral

Contamination of the material by coliform bacteria has been an occasional problem and has caused whole lots to be discarded. The company officials suspect that the bacteria are air-borne from Las Vegas Wash.

The deposit has a maximum thickness of 6 feet, and an estimated reserve of 4,000 to 7,000 tons. The present rate of production is between 100 and 300 tons per year from the Toddy claims. The waste to ore ratio is 50/50.

The clay on the Toddy claims is a thixotropic clay and has very good gel properties. The blended finished product is sold under the company name of "Vee-gum". The name, processes, products, and use, are all patented.

The deposits, location, and desired properties are as follows:

<u>Claim Name</u>	<u>Location</u>	<u>Properties</u>	<u>Claim Status</u>
Toddy	E. of Las Vegas, Nev.	high gel	unpatented
Beatty	Beatty, Nev.	stability & gel	patented
Blanco	S. of Coaldale Jct.	color & gel	unpatented
Sidehill	Death Valley Jct.	color	patented
Buff	Lovelock	color, stability	unpatented ?

These materials are blended together, as previously mentioned. The processing is done at Barstow, California and requires heat. The amount of heat is apparently extremely critical in that too much heat apparently destroys the gel

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The costs of hand-mining, hand-sorting, (in the case of the Beatty deposit underground mining), and processing the material, are extremely high at about \$100 per ton. The finished product, however, sells for \$7.50 per pound.

5. Current Activity: See above discussion.
6. Access: By gravel roads from the vicinity of the Johns-Manville gypsum plant in T.20S., R.64E.
7. Production Statistics: Present rate of production is 100 to 300 tons per year.
8. Selected References:

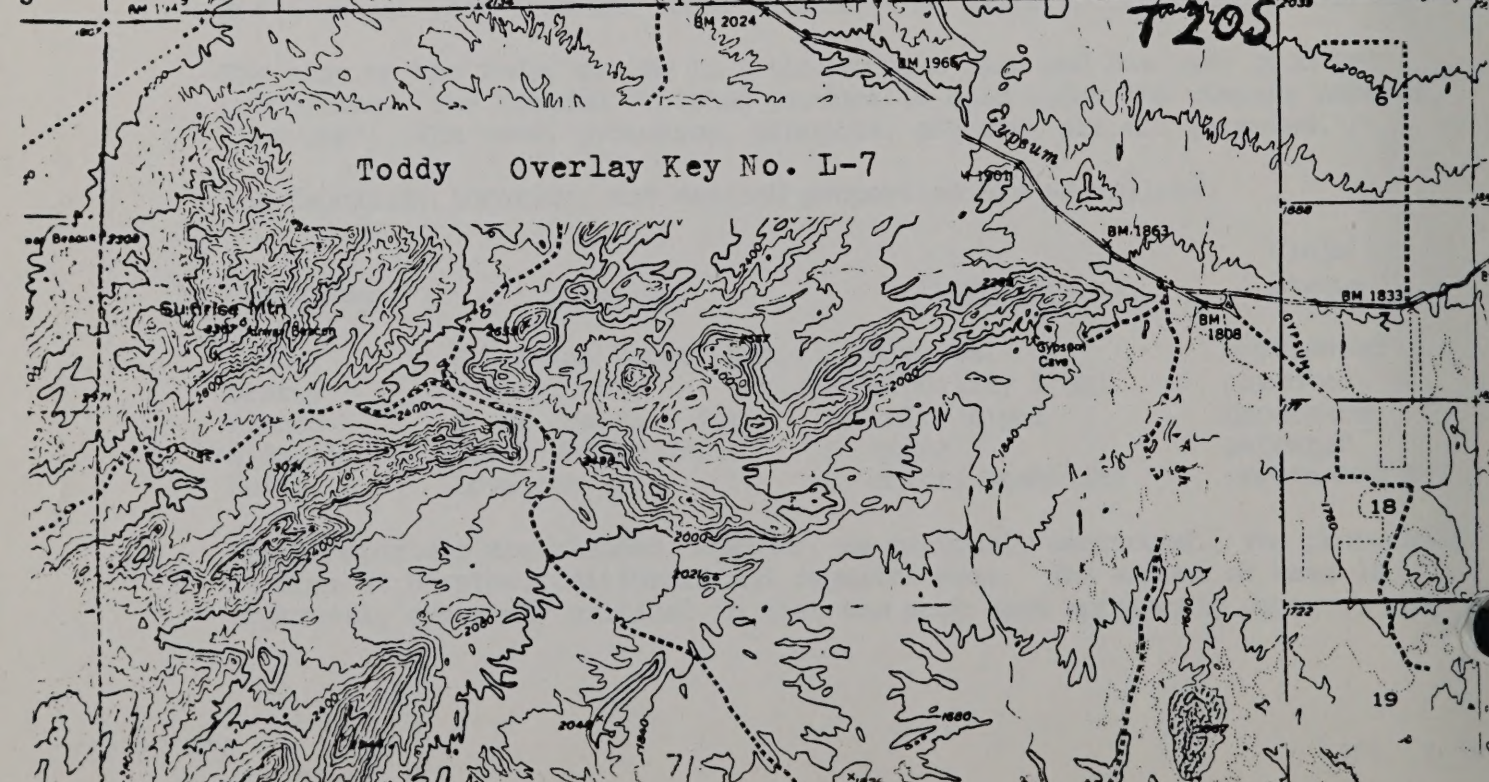
None.

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T19S



Toddy Overlay Key No. L-7



1. Mineral Area: White Basin
T.18 & 19S., R.66E.
2. Economic Type: Identified Subeconomic - Submarginal
Undiscovered for zeolites, sodium
3. Commodity: The White Basin area was extensively prospected for borates in the 1920's by American Borax Company and Pacific Coast Borax Company. Borate mining was accomplished by American Borax Company up to 1924 using inclined shafts and several hundred feet of lateral workings.

White Basin has been prospected for sodium and zeolites over the last 20 years.

4. Geologic and Other Technical Data: The White Basin is a structural feature formed during or prior to the Tertiary period. It has been partially filled with sediments of Tertiary age. These sediments are at least in part lake and evaporite deposits.

Prior to 1937, the American Borax Company explored part of the basin for borates. The borates were in the form of colemanite which formed lenses that were interbedded with clays, limestones, dolomites, and gypsum beds which form the Horse Spring Formation or its equivalents. The basin is surrounded by Paleozoic limestones or Mesozoic sandstones. Sandstones are commonest on the south rim of the basin, while limestones predominate on the north, west, and east. Presumably the borates were derived from these rocks through leaching.

5. Current Activity: Prospecting for sodium is currently occurring in this area under Sodium Prospecting Permits N-21141, N-21528, N-21678, and N-27176.
6. Access: Provided by the American Borax Company road, which connects to both the Valley of Fire access road and the Lake Mead National Recreation Area road.
7. Production Statistics: No production figures are available.
8. Selected References:
 1. Longwell et al. 1965.
 2. Papke, K. G. 1972.

1. Mineral Area: Salt Lake Freeway
T.13 - 22S., R.61 - 71E.
2. Economic Type: Identified Economic Reserve
(Subeconomic resources are also identified in the area
of the economic deposits.)
3. Commodity: Salt Lake Freeway is an informal name given to the extensive
sand and gravel deposits that fill the valleys between Las Vegas and the
Arizona state line.

A complete inventory of these resources has never been made. Such an inventory would entail extensive exploration to delineate the deposits and to determine their quantity, quality, impurities, etc. An inventory will probably never be made because of the time and expense involved. Areas or deposits will in all probability be explored and tested as needed.

Potential reserves are of vast proportions because any alluvial fan or valley-fill can be expected to contain some useable material. Most of these reserves have had little or no exploration work done on them and most will probably not be needed for many years to come, if at all. However, several areas can be expected to be exploited in the near future with some certainty.

These areas are the west side of the Sunrise Mountains, the Moapa Valley, and the Virgin Valley. The Moapa Valley area and the Virgin Valley area will be discussed in this writeup. The Sunrise Mountain area, because of its complexity and heavy use and demands, has been written up separately.

The sand and gravel of part of the Moapa Valley in the vicinity of the Valley of Fire State Park, has been placed under the mineral leasing laws by the Act of June 8, 1926. The Overton Wash (Overlay Key No. LS-12) write-up describes these deposits.

4. Geologic and Other Technical Data: The sand and gravel deposits in the area were formed by the erosion and deposition of materials from the nearby mountains. The mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province. Erosion of the mountains and deposition of the materials in the down-faulted valleys has been the major geologic activity in the area since that time.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foothills as alluvial fans. Finer materials are transported further into the valleys and the valley centers are generally covered by silts and clays.

Since the mountains in the area are composed of a variety of rock types, the sand and gravel also exhibits different characteristics in different areas. In the Sunrise Mountain area the deposits are largely carbonate rocks with minor amounts of metamorphic rocks and sandstone which have been derived from the predominantly limestone mountains.

In the Moapa Valley the gravel is also mostly limestone but appreciable volcanic rock also occurs in the deposits along with minor amounts of sandstone and reworked caliche.

In the Virgin Valley area the gravels are again predominantly limestones on the north side of the Virgin River. These gravels were probably derived from the Mormon Mountains to the north. On the south side of the Virgin River the gravel contains large quantities of Precambrian metamorphic rocks derived from the Virgin Mountains to the south.

Some caliche has probably formed in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes. Thick, extensive caliche deposits are known to occur on the bluffs to the south of Moapa.

5. Current Activity: Community pits in the Moapa Valley and Mesquite vicinity and the numerous material sites along Interstate 15 are all currently subject to use.
6. Access: Since all the active sites are near highways or population centers, access is available by well-used roads.
7. Production Statistics: No production figures are available.
8. Selected References:
 1. Longwell et al. 1965.
 2. Hess, 1971.
 3. Mineral T&R files

1. Mineral Area: Overton Wash
T.16 & 17S., R.66 & 67E.
2. Economic Type: Identified Subeconomic - Paramarginal
3. Commodity: Overton Wash is an informal name given to the above listed townships. Sand and gravel in this area became leasable through the passage of the Act of June 8, 1926 (44 Stat. 708) which patented the lands to the State of Nevada. The sections in which this Act applies are given in 43 CFR 3563.2.
4. Geologic and Other Technical Data: The Act of June 8, 1926, deemed the sand and gravel found in the effected sections to be a valuable mineral which was reserved when patent was issued. These deposits may be exploited under the regulations governing leasable minerals.
5. Current Activity: No sand and gravel leases are currently in effect, however, there are 3 BLM community pits in the Moapa Valley.
6. Access: There are three dirt, unmaintained roads running southwest from Logandale and Overton that provide access to this area.
7. Production Statistics: No production figures are available.
8. Selected References:
 1. 43 CFR 3563.2

1. Mineral Area: Callville Wash
T.20S., R.65E.
2. Economic Type: Identified Subeconomic - Submarginal
(Undiscovered resources are also identified in the
area of the subeconomic deposit.)
3. Commodity: Borate deposits related to those in White Basin were mined in
the Callville Wash area by West End Chemical Company from 1922 to 1928.
The main workings consisted of two adits and over 7,000 feet of underground
excavations. Mining ceased in 1928 because of competition from California.
4. Geologic and Other Technical Data: The borates, principally in the form of
colemanite, occur as beds within the limestone, dolomite, and gypsum of the
Horse Spring Formation. The colemanite deposit in Callville Wash is confined
to a single bed, 8 to 9 feet thick and averaging 25 to 40 percent colemanite.
This bed, dipping 45° to 65°S. was mined as the Anniversary Mine, principally
by underground methods as described above.
5. Current Activity: None.
6. Access: Access to the Callville Bay and Callville Wash area is provided by
roads from the north shore Lake Mead National Recreation Area road.
7. Production Statistics: Between 1922 and 1928, approximately 200,000 tons of
crude colemanite were mined here.
8. Selected References:
 1. Longwell et al. 1965.

Callville Wash
Overlay Key No. LS-15

TR PARK
BASELINE MESA
7 17 S

R65E

T20S

LAKE MEAD NATIONAL
RECREATION AREA

R. Sulenski
8/15/73

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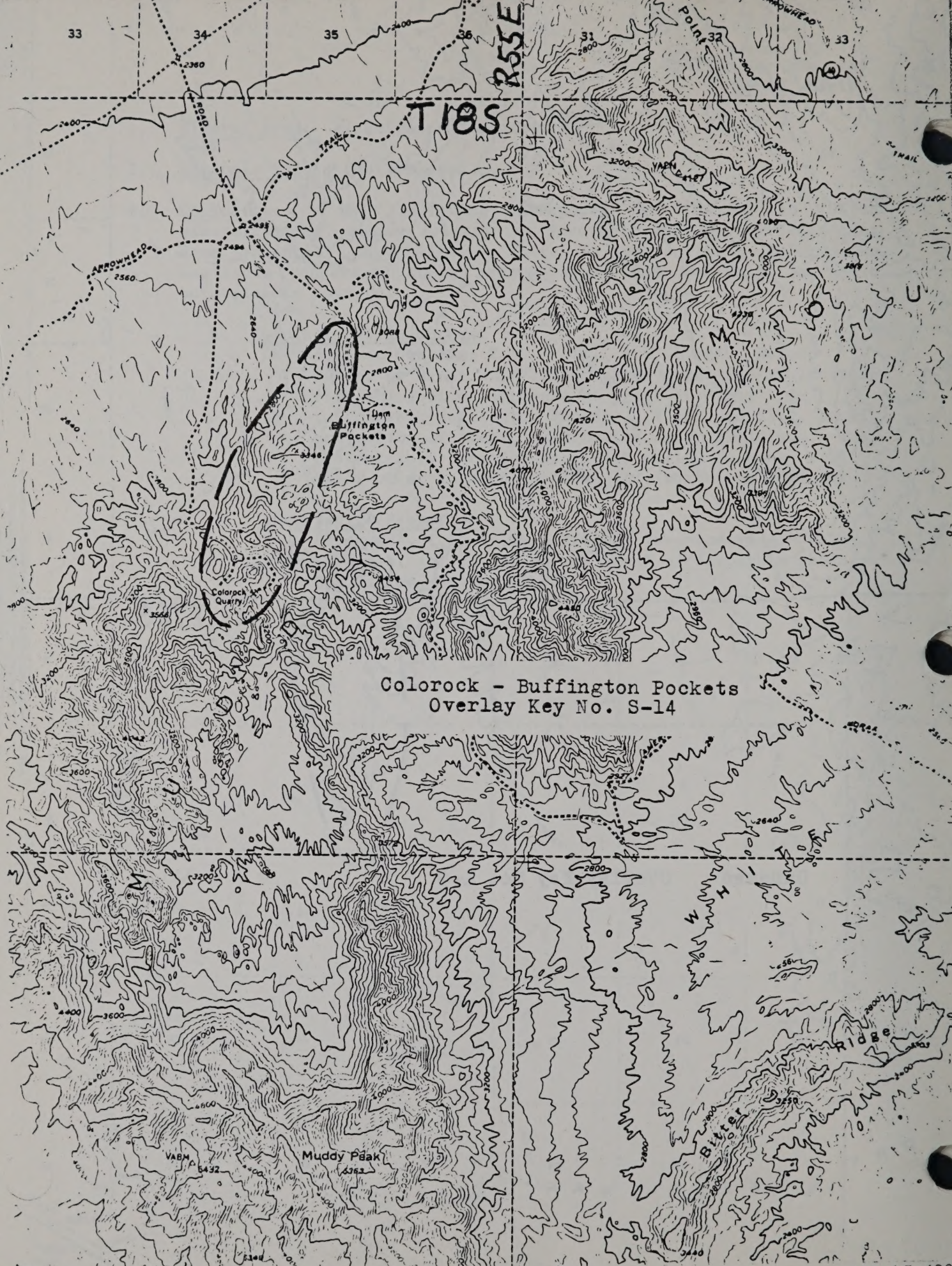
1. Mineral Area: Lake Mead National Recreation Area
2. Economic Type: Undiscovered Resources (Speculative)
3. Commodity: The Lake Mead National Recreation area was created by the Act of October 8, 1964 and provided for mineral leasing within the area to such an extent as is possible, consistent with the recreational and reclamation purposes of the area. This act makes all minerals, including those normally locatable, leasable except those that fall under the purview of the Materials Act (i.e., salable minerals).

Mineral development of the area is under the joint administration of the BLM, USGS, and the National Park Service.

4. Geologic and Other Technical Data: The Lake Mead National Recreation Area embraces a wide variety of rock types and potential mineral deposits. Gypsum (Overlay Key No. L-3), various metallic ores (L-6) and halite are known to occur in the area. Iron ore and turquoise have also been reported. A kimberlite diamond pipe also is rumored to exist.
5. Current Activity: Mineral lease (tungsten) N-4656 is currently active in T.20S., R.71E., Sec. 18.
6. Access: Access is provided to the Hells Kitchen area by unpaved roads south of Gold Butte.
7. Production Statistics: Production from this area has been insignificant.
8. Selected References:
 1. 43 CFR 3566

1. Mineral Area: Miscellaneous Prospects
2. Economic Type: Undiscovered
3. Commodity: The following prospects are areas in which mineralization, mining activity or favorable geology indicates that some potential may exist. There is very little information available concerning these prospects so that the value of their potential is unknown. .
 - a. Hypothetical Resources
 - LS-13: (East Overton) T.16 & 17S., R.67 & 68E., Nevada
Bureau of Mines Map #27 indicates magnesite at location #156 and sodium compounds at location #191.
 - LS-14: (Colorock-Buffington Pockets), T.18S., R.55E., small production of flagstone from the Aztec Sandstone. The rock at this location is a pale yellow to brown with bands of dark brown, yellow, red, white and lavender.
 - b. Speculative Resources
 - L-9: (Unnamed), T.15 & 16S., R.64E., inventoried as having potential for silica on the basis of favorable geology. See Tiffany-Crystal (L-2).

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Colorock - Buffington Pockets
Overlay Key No. S-14

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Entire Planning Unit
Oil and Gas

1. Mineral Area: Overthrust Belt
T.13 -20S., R.63 - 71E.
2. Economic Type: Undiscovered - Speculative Resources
3. Commodity: See Oil and Gas discussion.

C. Stateline Planning Unit

1. Identified Economic Reserves

The following mineral areas are considered to have identified economic reserves:

Measured Reserves: Blue Diamond (Overlay Key No. L-17)
Boulder City-Henderson (LS-41)
Flintkote-Sloan (L-22)
Hidden Valley (L-36)
Sunrise Mountain (S-46)

Indicated Reserves: Crescent Peak (L-18)
East Sunrise (S-45)
Nelson (L-19)
Searchlight (L-20)

Inferred Reserves: Tonopah Highway (S-47)

Locatable: Economic reserves within the Stateline Planning Unit consist of gypsum, limestone, gold, silver, and other base metal ores. Gypsum is currently being mined on Blue Diamond Hill by the Flintkote Company. Highgrade limestone is being mined by the U.S. Lime Division of Flintkote in the Sloan area. Hardrock mining is quite active in the Nelson, Searchlight, and Crescent Peak areas. Recent rises in noble metal prices as well as base metal prices have renewed interest in these once producing mining districts. Low grade ores known to exist are now economically mineable because of higher prices and new mining methods. Exploration for gold is particularly intensive.

Leasable: The only leasable mineral being mined in the planning unit is sand and gravel near Boulder City. Sand and gravel was made leasable in this instance pursuant to the Act of June 8, 1926 (44 Stat. 708).

Salable: The primary salable mineral in the planning unit is sand and gravel. Economic deposits are present in the following areas: Sunrise Mountain, Tonopah Highway, and West Las Vegas.

The planning unit has presently eight active community pits from which aggregate is being sold. Other aggregate sources are being disposed of by means of material sales contracts and free use permits.

2. Identified Subeconomic Resources

The following mineral areas are considered to have identified subeconomic resources:

Paramarginal: East McCullough (Overlay Key No. S-42)
Las Vegas Dunes (S-44)
Spring Mountain Gypsum - White
Beauty (L-29)
West Las Vegas (S-48)

Submarginal: Alunite (L-23)
Charleston (L-24)
Devil Peak (L-25)
Dike (L-33)
Gass Peak (L-34)
Goodsprings (L-26)
Las Vegas - Three Kids (L-32)
Los Angeles Freeway (S-43)
Newberry (L-21)
Ninety-Nine (L-28)
Pahrump Valley (S-53)
Perlite View (L-30)
Potosi - Green Monster (L-27)
Sunset (L-31)

Locatable: The only area with subeconomic paramarginal reserves is the White Beauty district at the northern end of Spring Mountain Gypsum. The Three Kids Mine economically exploited manganese until 1961, when the government discontinued its manganese stockpiling program. A considerably higher price would be necessary for this submarginal deposit to be reopened.

Subeconomic submarginal reserves represent the majority of known mineral occurrences within the planning unit. Twenty-three mineral areas fall into this category. Many of these areas have been mined in the past but higher mining costs and lower grade ore have shut them down. Others produced during times of need or high prices, such as a war emergency.

Leasable: No areas fall within this category.

Salable: Paramarginal reserves for sand and gravel are identified as the East McCullough, Los Angeles Freeway, and Tonopah Highway districts. Both the Nevada Department of Transportation and private companies are actively exploring these areas although it is highly unlikely these deposits will ever be mined to their full potential. Urban expansion and land needs by the City of Las Vegas will undoubtedly preclude development since both are incompatible with aggregate mining. Thus, a paradox is created. Sand and gravel is needed for growth but growth precludes the mining of sand and gravel. Aggregate operators as

well as government entities will be forced to move out beyond the Las Vegas Valley for aggregate sources. Aggregate prices will increase greatly because of the longer haul distances which will be paid for by the consumer.

Blow sand or dune sand has been sold from the Las Vegas Dunes, however, the area has been withdrawn for recreational purposes. Since the deposit is not legally available, the reserve is paramarginal.

Submarginal salable minerals, all sand and gravel, have been identified in the Aztec Tank, Boulder City, Eldorado Canyon, Las Vegas, and Pahrump Valley mining districts.

3. Undiscovered Resources

The following mineral areas are considered to have undiscovered resources:

Hypothetical: Gibford Claims (Overlay Key No. L-37)
 White Spot (L-35)
 Cottonwood Pass (L-40)
 Aztec Tank - Red Bluff (S-51)
 Nevada Royale (S-52)

Speculative: Jean Silica (L-38)
 Red Rock Wash (L-39)
 Sandstone Quarry (S-49)
 Oak Creek (S-50)
 Overthrust Belt - Entire Planning Unit

Locatable: Undiscovered minerals may reasonably be expected to exist in known mining districts. These resources are not necessarily surrounding known occurrences of minerals (although this is often a good place to start looking), but could be associated with the types of rocks and structures that are known to be producers of economic mineral resources at other places. Mining areas fitting into this category are Black Mountain, White Spot, Piute Valley, and the Gibford Claims. All are considered to be hypothetical undiscovered resources.

Leasable: The entire planning unit is considered a speculative resource area for oil and gas. For detailed information, refer to the Oil and Gas discussion. Between 1929 and 1980, 33 wells were drilled in the planning unit. All were fairly shallow (less than 5,000') and dry.

Salable: As in the Virgin Valley Planning Unit, every intermontane valley within the Stateline Planning Unit is considered a speculative undiscovered resource area for sand and

gravel. Likewise, an inventory of this resource has never been made, but one can reasonably assume alluvial fans and valley fill in the intermontane basins contain some usable material. Excessive market distances curtail development although sporadic use of this resource is made by the county and state highway departments for road construction and highway maintenance.

No undiscovered salable minerals other than sand and gravel are considered here because information is unavailable, but it is highly probable that building and construction minerals such as building stone, ornamental stone, volcanic cinders, and sand and gravel could be found in many parts of the planning unit. Because these materials cannot be economically transported very far, most cannot be considered of value unless there is a local market.

4. Mineral Resource Areas

Overlay Key Number

L-17	Blue Diamond
L-18	Crescent Peak
L-19	Nelson
L-20	Searchlight
L-21	Newberry
L-22	Flintkote - Sloan
L-23	Alunite
L-24	Charleston
L-25	Devil Peak
L-26	Goodsprings
L-27	Potosi - Green Monster
L-28	Ninety-Nine
L-29	White Beauty
L-30	Perlite View
L-31	Sunset
L-32	Las Vegas - Three Kids
L-33	Dike
L-34	Gass Peak
L-35	White Spot
L-36	Hidden Valley
L-37	Gibford Claims
L-38	Jean Silica (Miscellaneous Prospect)
L-39	Red Rock Wash (Miscellaneous Prospect)
L-40	Cottonwood Pass (Miscellaneous Prospect)
LS-41	Boulder City - Henderson
S-42	East McCullough
S-43	Los Angeles Freeway
S-44	Las Vegas Dunes
S-45	East Sunrise
S-46	Sunrise Mountains
S-47	Tonopah Highway
S-48	West Las Vegas
S-49	Sandstone Quarry (Miscellaneous Prospect)
S-50	Oak Creek (Miscellaneous Prospect)
S-51	Aztec Tank - Red Bluff (Miscellaneous Prospect)
S-52	Nevada Royale (Miscellaneous Prospect)
S-53	Pahrump Valley

1. Mineral Area: Spring Mountain Gypsum (Blue Diamond (L-17), White Beauty (L-29))
T.19 - 24S., R.57 - 60E.
2. Economic Type: Identified Economic Reserves--Measured
Identified Subeconomic Resource - Paramarginal
3. Commodity: An extensive area to the west of Las Vegas is potentially valuable for gypsum. This area stretches from near Kyle Canyon Road through the eastern Spring and Bird Spring Mountains south to Table Mountain. It extends from near Lovell Canyon and Potosi Wash eastward to the alluvial fans that flank the west side of the Las Vegas Valley. This area includes most of the La Madre Mountains and a good deal of the Red Rock Canyon Recreation Lands including the Wilson Cliffs.

Mining of gypsum is taking place at two locations within the area. At the north end is the White Beauty Mine (Paramarginal) and on the east is the Blue Diamond Mine (Measured Reserves). See the individual writeups on these areas.

4. Geologic and Other Technical Data: Gypsum occurs as thick beds within the Permian red beds and the overlying Toroweap and Kaibab Formations also of Permian age. It also occurs less commonly in the Moenkopi and Chinle Formations of Triassic age. The eastern Spring and Bird Spring Mountains contain thick sequences of these rocks and are therefore potentially valuable for gypsum.

The Permian red beds lie above the Bird Spring Formation in the Spring Mountains. These beds generally contain two major units. The lower member consists chiefly of pink-gray sandstone, which is thick-bedded or cross-bedded. The upper member is chiefly reddish sandy shale and fine-grained sandstone. Both members vary laterally in the kinds and proportions of sediments. In the Goodsprings area, these beds are about 1,100 feet thick.

The Kaibab and Toroweap Formations overlie the Permian red beds. Both of these formations are limestones with beds of shale, sandstone, gypsum, and dark chert. The alternating light-colored rocks and dark chert give a striped appearance to hills composed of these rocks. The stratigraphy of these formations is typically:

<u>Thickness</u>	<u>Composition</u>
150' - 225'	red shale, gypsum, chert, gray limestone, and dolomite (Harrisburg Gypsiferous Member)
400'	dark gray limestone with abundant chert
5 - 20+'	basal Kaibab, breccia with fragments of underlying rocks
100'	red shale and sandstone with variable amounts of gypsum
200 - 250'	massive limestone with chert bands
125'	Basal Toroweap, sandstone and shale with considerable gypsum

The basal Moenkopi unconformably overlies the Kaibab. The basal unit is a conglomerate that ranges from 3 to 50 feet thick. The typical stratigraphy is:

<u>Thickness</u>	<u>Composition</u>
400' - 950'	Brown to red shale and sandstone with irregular beds of gypsum and gray sandstone
200' - 500'	Whitish, thin-bedded shales, limestones, dolomites and fine grained sandstones with a high percentage of gypsum
200' - 700'	Thin-bedded limestones containing marine fossils, with minor shale and fine-grained sandstones, gypsum occurs in the upper beds
350'	Reddish shales and sandstones interspersed with gypsum and dolomite beds
50'	Basal Moenkopi. Conglomerate to breccia containing clasts of limestone and chert derived from the Kaibab and Toroweap with lenses of yellow and red sandstone

Tuffaceous rocks and volcanic pebble conglomerates have been reported in the upper shaly part of the Moenkopi about 2.5 miles west of Goodsprings. These rocks are the oldest record of volcanic activity in Southern Nevada.

The Chinle Formation overlies the Moenkopi. It shows no evidence of a marine origin and is thought to represent deposition in channels and lakes and on stream floodplains. The lithology of the formation is highly variable and ranges from crossbedded sandstones and conglomerates to laminar sandstones and volcanic ash beds. The typical stratigraphy of the formation is as follows:

<u>Thickness</u>	<u>Composition</u>
750' - 885'	Variegated shales and sandstones with considerable gypsum in beds, fossil wood occurs in some of the upper sandy beds
10' - 250'	Basal Chinle (Shinarump Member) - red, cross-bedded, coarse-grained sandstone and conglomerate; pebbles of chert, quartz, red-brown jasper, quartzite, limestone, and dolomite occur, most pebbles are well-rounded; petrified wood either as logs or fragments is a common constituent

Aztec Sandstone overlies the Chinle Formation. The Aztec Formation is composed almost entirely of crossbedded sandstones. No gypsum has been reported in the formation. It is conformable to the underlying Chinle.

5. Current Activity: A patent application for the White Beauty claims was filed on 12-7-79, case file number N-27611. No action has been taken on this.
6. Access: Provided by Kyle Canyon Road and existing dirt roads.

7. Production Statistics: Unavailable at this time. When the patent application is processed, these figures will become available.
8. References:
 1. Case file N-27611
 2. Longwell et al. 1965.

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White Beauty (L-29)

White
Beauty

Blue
Diamond

LAS

Blue Diamond

18/5/06

Dr. S.

12/17

GR

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10/11/19

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18



10

Good

Mill



2

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11/11

SE 23-3

Spring Mtn.
Gypsum

Pyrene

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1. Mineral Area: Blue Diamond
T.21 & 22S., R.59 & 60E.
2. Economic Type: Identified Economic Reserve - Measured
(Subeconomic and undiscovered resources are identified
in the area of the economic deposit.)
3. Commodity: The Blue Diamond Mine is exploiting a portion of the extensive gypsum deposits that occur in the eastern Spring Mountains (see Spring Mountain Gypsum). The operation consists of the open pit mine, a plaster mill, and a gypsum lath and wallboard plant. The mine has been active since 1909 and production exceeds 300,000 tons of gypsum annually. The Blue Diamond Mine is a division of the Flintkote Company.
4. Geological and Other Technical Data: The Blue Diamond Mine is working the gypsum found in the Permian red beds and the overlaying Toroweap and Kaibab Formations which form the low hills commonly called the Blue Diamond Hills. The gypsum beds are generally between 5 feet to 15 feet thick but locally may be 75 feet thick. At a depth of 50 feet to 100 feet from the surface, the gypsum passes into anhydrite.

Present production is chiefly from the upper (Harrisburg) member of the Kaibab Formation. The known reserves are large and new exploration will probably reveal other large deposits in the area.

5. Current Activity: The mine and plant have been in operation for many years. Known reserves are large and new reserves will probably be discovered in the area. The operation will continue at its present capacity or above for the foreseeable future.

Exploration of other portions of the deposit can be expected, but no new mines are expected to result. See the accompanying map for the most likely areas of development. Areas where good quality gypsum is known to occur are indicated, but excessive overburden makes the development of the deposits unlikely in the foreseeable future.

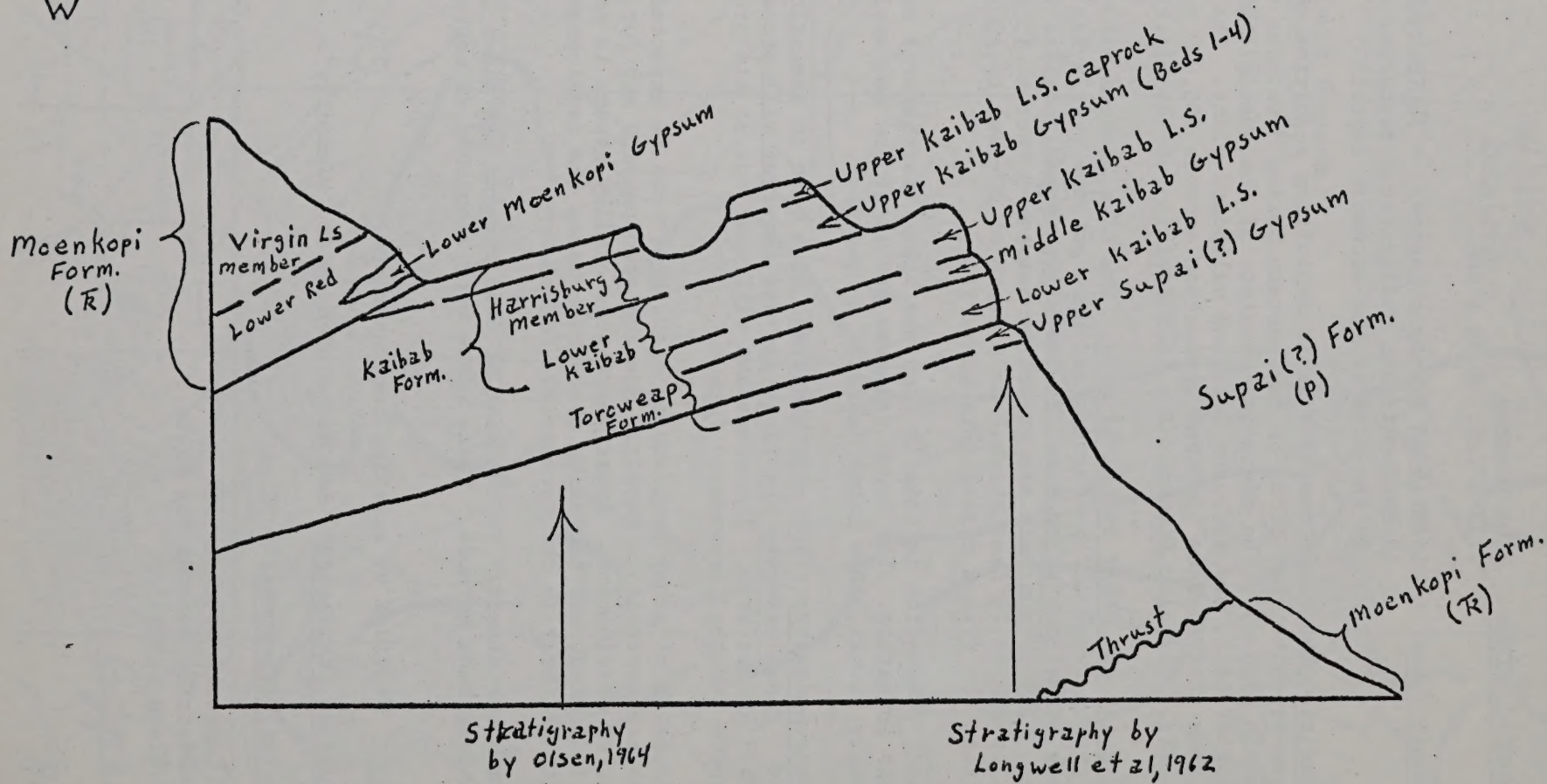
The deposit directly to the east of Blue Diamond was mined in the past by underground methods. These mines were abandoned as unprofitable.

6. Access: Provided by existing company roads.
7. Production Statistics: See discussion under "commodity".
8. Selected References:
 1. Longwell et al. 1965.
 2. District Mineral T&R files.
 3. Olsen 1964.

Stratigraphy at Blue Diamond

W

E



APR 15 1981

R. Sulenski 5/3/73
from
Olsen, 1964



Blue Diamond
Overlay Key No. L-17

Overlay Key No. L-18
silver, gold, copper,
molybdenum, fluorspar,
perlite, turquoise,
thorium, uranium?,
apatite, beryl

1. Mineral Area: Crescent Peak (Nipton, Nu-Lite, Crescent)
T.27 - 30S., R.60 - 62E.,
2. Economic Type: Identified Economic Reserve - Indicated
(Subeconomic and undiscovered resources are identified in the
area of the economic deposit.)
3. Commodity: The district was activated in 1894 with the rediscovery of the
turquoise mines previously worked by the Indians. A considerable amount of
turquoise was apparently produced from the area.

In 1905 the metal mines in the district were opened. The chief production
occurred in 1905-1907, 1911, 1930, and from 1934 to 1941. The mines have
been inactive from 1942-1977.

4. Geologic and Other Technical Data: The country rock of the area is predom-
inantly Precambrian gneiss associated with schists and quartzites that have been
cut by granitic and amphibolite dikes. A quartz monzonite located at Crescent
Peak itself has been explored in recent years as a possible low grade copper
deposit. The rock is known to contain disseminated copper minerals.

The turquoise is found in seams and veinlets in the granitic intrusives and
also in rhyolite. The silver and gold occurred in shattered masses of quart-
zite that had been recemented by quartz.

The most productive mines in the area, at least for metallic ores, were the
Double Standard, Lily Group, and Sundog Mines.

At the Double Standard, the workings explored a shear zone in granite gneiss
which contained quartz lenses with galena, tetrahedrite, and chalcopyrite.
Barite is a common gangue mineral in the ore.

The Lily Group explored quartzite breccias for gold. No production is recorded.

The Sundog Mine was in a mineralized quartz vein that cut granite. The ore con-
tained bornite, chalcopyrite, and copper oxides. There is no recorded production.

A thorium prospect located in Section 32, T.29S., R.61E., explored a small
Tertiary or Cretaceous quartz monzonite body that intrudes Precambrian rocks.
The quartz monzonite has been altered to monazite-apatite at its core which is
75 feet in diameter. This core contains 30% monazite and 60% apatite. The rock
is strongly radioactive. There has been no development or production.

Nu-Lite Insulated Homes Inc. has exploited an extensive perlite deposit that
contains both "onion-skin" and "sugar-loaf" grades. Production began in 1948 and
has been intermittent since. Reserves are estimated at 200,000,000 tons. Perlite
has also been reported in T.30S., R.62E.,

Beryl has been reported from the district.

5. Current Activity: Several mining claimants are operating heap leach pads in this
district. They are processing mine dumps and perhaps some old mine workings.

6. Access: Provided by existing roads.

7. Production Statistics: From 1894-1941:

Gold	(ozs)	1,124
Silver	(ozs)	33,064
Copper	(lbs)	1,809
Lead	(lbs)	24,863

Current production is confidential.

8. Selected References:

1. Longwell et al. 1965
2. U.S.G.S. 1964.

1. Mineral Area: Eldorado Mountains (Nelson (Overlay Key No. L-19), Searchlight (L-20), Newberry (L-21))
T.24 - 32S., R.63 - 65E.
2. Economic Type: See write-ups on Nelson, Searchlight, and Newberry Districts.
3. Commodity: The Eldorado Mountains area is composed of the Eldorado, Opal, and Newberry Mountains, which form a more or less continuous north-south trending chain. Within this chain are located the Nelson, Searchlight, and Newberry mining districts. Besides these three districts a number of mineral prospects, exploration shafts and pits, and old mines exist in the area. Of these, the St. Louis and Rockefeller Mines south of Nelson and the Mammoth Mine south of Searchlight appear to be the largest.
4. Geologic and Other Technical Data: The mountains that make up this area are composed primarily of Tertiary volcanics in the north and Precambrian igneous and metamorphic rocks in the south. The change in lithology occurs in the Eldorado Valley near Nelson.

The southern metamorphic rocks have been cut by several younger intrusive bodies and volcanic rocks of Tertiary age cover small portions of the area. Faults border many of the larger intrusive bodies and are probably related to their emplacement. At Nelson the relationship between the host rock and intrusive rocks is extremely complex. Intrusive material has cut across or engulfed the host rocks and in some areas, especially southwest of Nelson, the rocks are so intermingled that the resulting chaotic mass can be mapped as a unit.

Large plutons exist near the head of Aztec Wash and about 5 miles west of Nelson. The body near Nelson is an elongate granitic mass with abundant pink orthoclase and a coarse texture. The Aztec Wash pluton is medium-grained with a composition near quartz monzonite. It is irregular in shape and has many subordinate dikes and veins which have invaded the country rock.

The smaller intrusive rocks at the southern end of the range are predominantly andesite porphyries.

North of Nelson, the rocks are predominantly of Tertiary volcanic type. At least three assemblages of such rocks have been defined. They have been extensively faulted and repeated sequences are common. The rocks generally dip steeply eastward and the downthrow is generally to the west, except for one large block about 4 miles northwest of Nelson where the volcanics have been dropped against Precambrian rocks. North of this locality the rocks dip westward.

The volcanics consist of numerous flows which vary in lithology and composition. Flows with phenocrysts of pyroxene and feldspar up to $\frac{1}{4}$ inch are common. Several coarse conglomerates and breccias also occur in the area. Exposures along highway 60 to the west of Nelson are composed of pale brown sand and silt with rounded or subrounded cobbles and pebbles of the volcanic rocks. Some of the conglomerates are near the mountain crestline and appear

The ores in this district are generally quartz veins with free gold and/or sulfides, associated with quartz monzonites of Tertiary age.

The major mining and mineralized zones within this area have been individually described and should be referred to.

Lesser mineralized areas include:

Mammoth Mine - Sec. 20, T.29S., R.63E.

St. Louis Mine - Sec. 32, T.27S., R.64E.

Rockefeller Mine - Sec. 30, T.27S., R.65E.

Unnamed - Sec. 7, 13, 18, T.28S., R.64E.

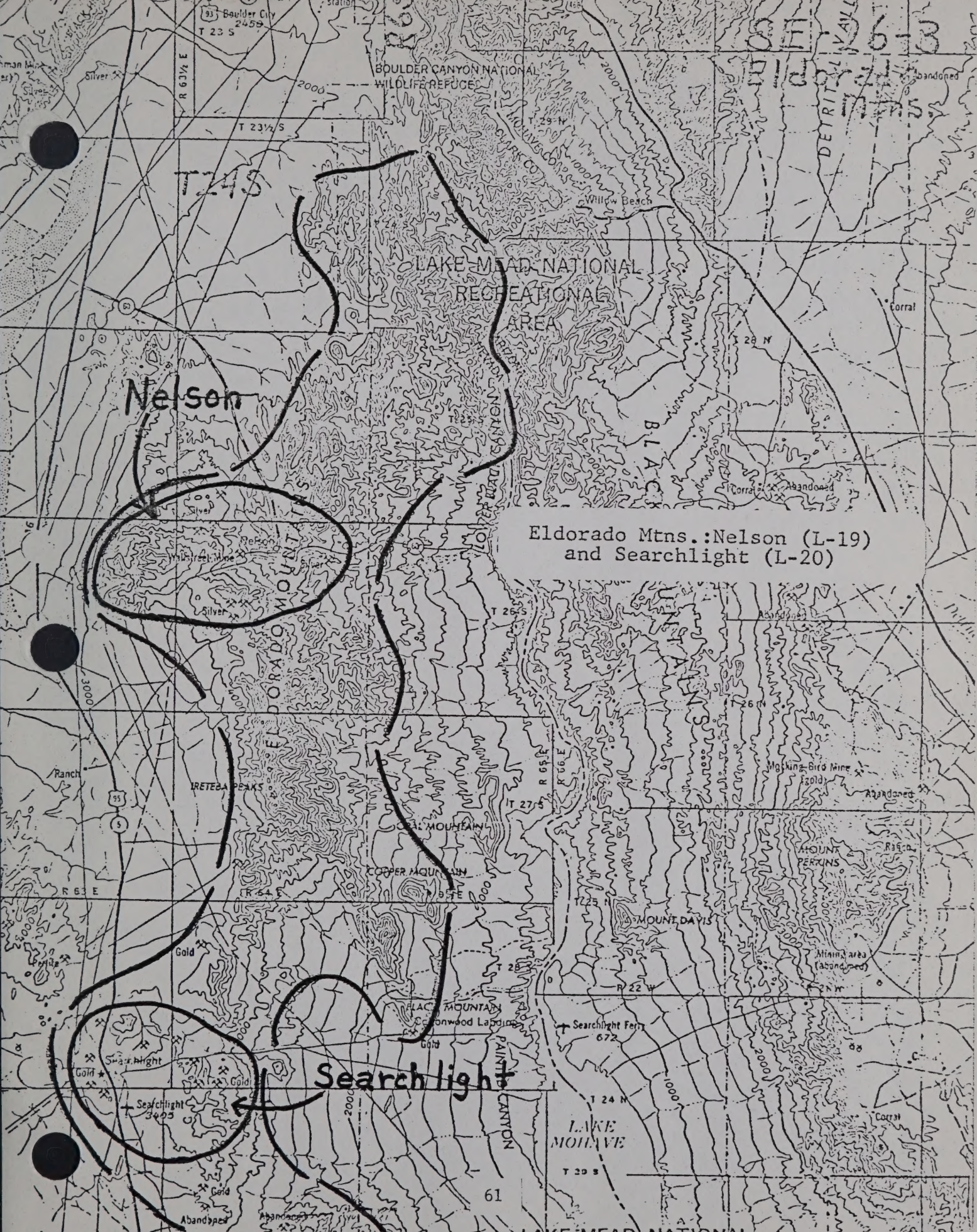
5. Current Activity: Heavy exploration in entire district.

6. Access: See individual write-ups.

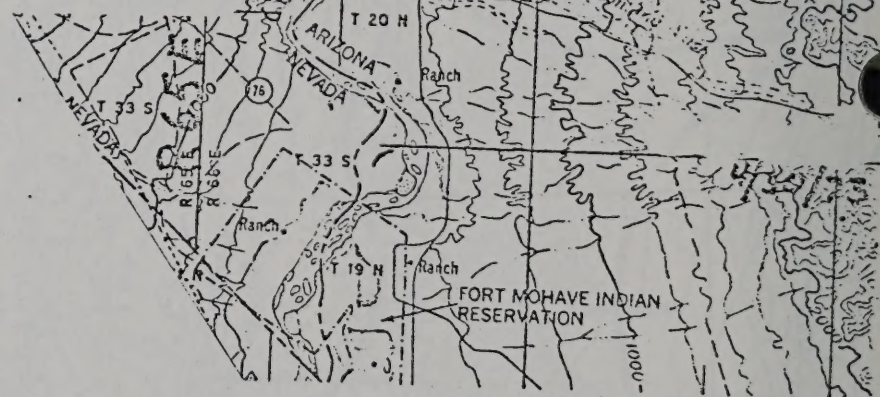
7. Production Statistics: See individual write-ups.

8. Selected References:

1. Longwell et al. 1965.



Eldorado Mtns, cont.:
Newberry (L-21)



1. Mineral Area: Nelson
T.25 & 26S., R.63 & 64E.
2. Economic Type: Identified Economic Reserve - Indicated
(Subeconomic and undiscovered resources are also identified in the area of the economic deposit.)
3. Commodity: The Nelson District is one of the oldest in Nevada. Mining began in 1857, but old pits were found in the area at that time and it is probable that the Spanish or Mexicans mined gold in the area prior to 1857. The district is located in the Eldorado Mountains about 40 miles south of Las Vegas on U.S. Highway 95.

A large number of the original mines were bought up by the Southwestern Mining Company. This company dominated the district until 1897 when many of the mines were sold or leased. After 1900 the Techatticup and Eldorado Rand Mines were the chief producers in the area. These mines were being worked until 1961 but since then have been idle. They were not listed as operating mines in 1971.

Between 1907 and 1961, \$4,626,033 worth of metals were mined in the district, mostly from the Techatticup and Eldorado Rand Mines. An estimated \$2,000,000 to \$5,000,000 worth of production was removed between 1861 and 1906.

4. Geologic and Other Technical Data: The ore is associated with quartz monzonite of Tertiary age, and occurs in fissures in the country rock which is generally an andesite or rhyolite, but lavas, breccias, and tuffs also occur. These fissures extend into the quartz monzonite.

The deposits at Knob Hill about 2 1/2 miles south of Nelson are in Precambrian schist and gneiss which have been cut by dikes of pegmatite, aplite, fine-grained quartz monzonite, and andesitic porphyries. The ore veins run east-west and dip 70° to 90°S.

Techatticup Mine - This mine has been the largest producer in the district. Between 1870 and 1900 more than \$3,500,000 in ore was produced. An additional \$1,117,200 was mined between 1900 and 1930.

The main vein at the mine cut through the quartz monzonite at N72° to 80°E and with a dip of 65° to 75°N. The vein is exposed at the surface for about 3,600 feet. The vein splits near the main shaft with the main vein continuing northeast while the branch, the Savage vein, trends southeast and dips 60°N. Both veins range from 2 to 12 feet in thickness and are composed principally of quartz, calcite, quartz monzonite fragments, and small quantities of pyrite, sphalerite, galena, and chrysocolla. The percentage of pyrite increases slightly with depth. Free gold is present in most of the ore but is rarely visible.

Wall Street Mine - This mine is about 15 miles west of Nelson. About 6,500 tons of ore valued at about \$55,000 were mined between 1935 and 1937. A total production of \$1,750,000 is estimated for the mine. The vein and ore materials as well as the host rock are similar to that of the Techatticup Mine.

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Eldorado Rand Group (Rand and Quaker City) - This mine consisted of 3 patented and 24 unpatented claims. The veins and ore are similar to the Techatticup but the ore is more oxidized. About \$1,000,000 in gold and silver were mined from these claims.

Mercury was reported at the Patsy Mine and zinc in the Knob Hill area. No production of either has been reported.

5. Current Activity: Intermountain Exploration Company is in the final planning stages for an open pit gold mine in the Techatticup Mine area. They have extensively sampled and drilled the area. Dump reprocessing is planned. They believe the entire district could be valuable for gold due to higher prices.
6. Access: Provided by existing mine roads.
7. Production Statistics: Included in discussion of geologic data above.
8. Selected References:
 1. Longwell et al. 1965.

Eldorado Canyon District (Eldorado, Colorado, Nelson)

Belmont-Phoenix mine(195) (Oro Plata mine)	Sec. 33, T. 26 S., R. 64 E.	Ag, Au, Cu, Pb	Quartz veins in Precambrian rocks.	Recorded production (1940 - 1941) equals: 75,906 oz of silver, 286 oz gold, 7,785 lb lead, 502 lb copper.
Buster claim(183)	E½ sec. 3, T. 26 S., R. 64 E.	Cu(?), Au(?)	Quartz veins in andesite(?). Mangan- ese oxides and malachite on dump.	No recorded production. Ransome, 1907, p. 76-78.
Capitol mine and Capitol area(194)	Sec. 20, T. 26 S., R. 65 E.	Au, Ag	Quartz veins in quartz monzonite and andesite.	Production from Capitol mine reported at \$100,000. Vanderburg, 1937, p. 33-34.
Combination mine (See Nob Hill area)				
Eldorado Crown Mining Co.(187)	Sec. 12, T. 26 S., R. 64 E.	Au, Ag	do.	Production reported at \$450,000 prior to 1907. Developed by an inclined shaft and more than 1 mile of under- ground workings. Vanderburg, 1937, p. 32.
Eldorado Empire Mining Co.(180)	Sec. 4, T. 26 S., R. 64 E.	Au	Ore in 40-foot breccia zone in quartz monzonite.	Small production reported. Vanderburg, 1937, p. 33.
Eldorado Rand group(188) (Rand, Quaker City, and Honest Miner patented claims)	Sec. 8, T. 26 S., R. 64 E.	Au	Quartz veins cutting quartz monzonite. Original pyrite in vein oxidized to form free-milling gold ore.	Production estimated at \$1,000,000 from the Rand and Quaker City claims. Original gold discovery in Eldorado Canyon reported to be on Honest Miner claim. Approximately 6,000 feet of underground workings includ- ing the 350-foot Rand shaft. Under- ground workings on Quaker City claim also. Ransome, 1907, p. 76-77.
Eldorado Rover Mining Co. (186) (Rover, Flagstaff (Duncan), Rambler, and Skylark claims)	N½ sec. 11, T. 26 S., R. 64 E.	Au, Ag	Quartz veins in quartz monzonite or at the contact of quartz monzonite and andesite.	Production to 1937 reported at \$550,- 000. Underground workings total about 4 miles. Vanderburg, 1937, p. 31.
Golden Empire(189)	Sec. 17, T. 26 S., R. 64 E.	Au, Ag	Quartz veins cutting Precambrian gneiss and schist.	Production reported at more than \$50,- 000. Vanderburg, 1937, p. 33.
Jubilee mine(185)	Sec. 1, T. 26 S., R. 64 E.	Au	Quartz veins cutting quartz monzonite.	Production estimated at more than \$10,- 000. Underground workings totaling about 1,000 feet, were all in ore.
Mocking Bird mine(181)	Sec. 5, T. 26 S., R. 64 E.	Au, Ag	do.	Production reported at \$240,000 in early years. Ransome, 1907, p. 77.
Montana claim(193)	Sec. 20, T. 26 S., R. 65 E.	Au	Quartz veins in quartz monzonite and andesite.	No recorded production.
Nob Hill area: Rich Hill mine(190) Combination mine(191) Silver Legion mine(192)	Sec. 16, T. 26 S., R. 64 E. Sec. 17, T. 26 S., R. 64 E. Sec. 20, T. 26 S., R. 64 E.	Au, Ag, Pb Zn	Pyrite, galena and sphalerite in quartz veins cutting Precambrian gneiss and schist. Oxidized ore contained free gold and horn silver (cerargyrite).	Production from each mine estimated at more than \$100,000. Ransome, 1907, p. 76.
Patsy mine(179)	Sec. 33, T. 25 S., R. 64 E.	Hg	Cinnabar and native mercury in Tertiary volcanic rock.	No recorded production. Bailey and Phoenix, 1944, p. 53.
Rich Hill mine (See Nob Hill area)				
Silver Legion mine (See Nob Hill area)				
Techatticup mine(184)	Sec. 2, T. 26 S., R. 64 E.	Au	Quartz vein cutting quartz monzonite. Vein strikes N. 72° to 82° E., dips 65° to 75° N., and can be traced for more than a mile (pl. 11 and fig. 9). Some free gold and pyrite, sphalerite, galena, and chrysocolla.	Production estimated at more than \$3,- 500,000. A 250-ton cyanide mill on property. Underground workings total about 3 miles. Weed, 1935¹.
Wall Street mine(182)	Sec. 4, T. 26 S., R. 64 E.	Au, Ag	Quartz vein cutting quartz monzonite (fig. 10).	Production (to 1937) reported as more than \$1,800,000. Mine operated until 1943. Fifty-ton amalgamation-flota- tion mill erected in 1935. Ransome, 1907, p. 77-78; Vanderburg, 1937, p. 27.

1. Mineral Area: Searchlight
T.28 & 29S., R.63 & 64E.
2. Economic Type: Identified Economic Reserve - Indicated
(Subeconomic and undiscovered resources are also
identified in the area of the economic deposit.)
3. Commodity: The town of Searchlight is located at the intersection of
highways 95 and 68 in Clark County, about 26 miles south of Boulder
City and about 55 miles south of Las Vegas. The town was built on
the mineralized area and shafts and old workings occur in all directions
from the town.

The mineralized area is located in the southern Eldorado Mountains and
northern Opal Mountains and is part of an extensive mineralized zone
that stretches from Nelson on the north to Newberry on the south.

The area was discovered in 1897 and has produced about \$7,000,000. It
became inactive in 1954.

4. Geologic and Other Technical Data: The area is largely underlain by
igneous rocks of presumed Tertiary Age. These rocks are predominantly
andesites, andesite porphyries, and quartz monzonite. The andesite was
altered to hornfels following the intrusion of the quartz monzonite.
These hornfels were subsequently fractured. The metalliferous veins
were deposited in these fractures near the andesite-quartz monzonite
boundary.

The veins are generally breccias cemented by quartz. Those found in
the southern portion of the district are quartz veins accompanied by
adularization and silicification of the wall rock. They contained con-
siderable quantities of base metal sulfides. In the north the veins
appear to be of low temperature origin. The quartz is associated with
lamellar calcite with very little sulfide ore. The gold and silver
ratio was higher than in the south.

The ores are largely oxidized, with oxidized lead, zinc, and copper
minerals as well as sphalerite, galena, and chalcopryrite, being found.
The principal production was from lead carbonate ores. In the surficial
ores gold exceeded silver but in the subsurface silver was higher.
Zinc is reported to occur at the Big Casino (Monte Carlo) Mine but no
production is recorded.

Quartette Mine - This mine was the largest producer in
the district and is typical of the southern mines. It
produced 64% of the gold, 21% of the silver, 58% of the
copper, and 14% of the lead recorded for the district.
It was most active between 1902 and 1923 during which a
total of \$2,800,000 in metals was produced.

The ore is a shattered mass of country rock in which
oxidized ore minerals occur. Chalcocite, galena, chry-
socola, cuprite, cerussite, wulfenite, and hematite,
occur in the veins, mostly as small vug fillings or
kernels.

The main ore vein strikes N 70¼ W and dips 40¼ to 60¼S. It is at least 3,300 feet long. A large number of stopes have been cut into the vein from the main shafts, from the 100 to the 1,100 foot level.

Blossom Mine - This mine is typical of the northern mines. The ore is a quartz-cemented breccia containing visible gold, limonite, specular hematite, calcite, and invisible silver. The ore is restricted to lenses within the vein which are less than 3 feet thick. The mine was most active between 1903 and 1906 and produced more than \$325,000 in gold and silver.

5. Current Activity: In the Quartette-Duplex Mine area, and within a radius of approximately 1/8 mile, Gold Creek Mining Company has identified a gold reserve. They are planning to open-pit the mine area itself and possibly reprocess the dumps of surrounding mines. To that end, they have staked 21 millsite claims approximately 1/2 mile west of the Quartette Mine and are in the process of constructing a leach pad mill to handle the ore.
6. Access: Provided by existing dirt roads.
7. Production Statistics: See the following tables.
8. Selected References:
 1. Longwell et al. 1965.

Searchlight District

Bay City group(207)	S½ sec. 29, T. 28 S., R. 63 E.	Au(?)	Quartz veins in andesite near contact with quartz monzonite intrusive.	Total production of \$1,000 in 1936. Vanderburg, 1937, p. 78.
Big Casino mine(217) (Monte Carlo mine)	SW¼ sec. 32, T. 28 S., R. 64 E.	Pb, Zn, Cu, Au, Ag	Quartz veins cutting andesite porphyry. Veins contain galena, chalcopyrite, and sphalerite.	Total production of more than \$100,000 from 1913 to 1941. Copper and lead produced in addition to gold and silver. Callaghan, 1939, p. 176.
Blossom mine(203)	Sec. 23, T. 28 S., R. 63 E.	Au, Ag	Flat quartz-cemented breccia at the contact of a sill-like body of quartz monzonite and hornfelsized andesite and intrusive andesite porphyry. Free gold associated with limonite occurred in the quartz.	Production of more than \$325,000 prior to 1947, largely before 1906. Small production reported in 1961 and 1962. Callaghan, 1939, p. 176-179.
Boston mine(210)	Secs. 25 and 26, T. 28 S., R. 63 E.	Cu, Au	Quartz veins in shattered andesite porphyry near contact with quartz monzonite. Good ore consisted of chalcocite, malachite, azurite, chrysocolla, and cerussite.	No recorded production. Callaghan, 1939, p. 183-184.
Chief of the Hills mine(216)	S½ sec. 32, T. 28 S., R. 64 E.	Au(?)	do.	do.
Cyrus Noble mine(212)	SW¼ sec. 34, T. 28 S., R. 63 E.	Ag, Au	Quartz vein cutting gneiss, hornfels and andesite porphyry. Gold associated with chrysocolla and cuprite. Silver associated with galena and cerussite. Some hematite and wulfenite.	Small production recorded. Callaghan, 1939, p. 172-173.
Duplex mine(213)	SE¼ sec. 34, T. 28 S., R. 63 E.	Au, Ag, Pb, Cu	do.	Production estimated at more than \$650,000. Callaghan, 1939, p. 165-172.
Good Hope mine(214) (Phoenix mine)	NE¼ sec. 3, T. 29 S., R. 63 E.	Au, Ag	do.	Production estimated at more than \$100,000. Callaghan, 1939, p. 164.
J. E. T. mine(202)	N½ sec. 23, T. 28 S., R. 63 E.	Au	Geology same as Pompeii mine. Two carbonate veins exposed on property but contain no ore.	Only recorded production in 1929. Callaghan, 1939, p. 180-182.
Monte Carlo mine (See Big Casino mine)				
New Era mine(218)	Sec. 34, T. 28 S., R. 64 E.	Au(?)	Geology same as Pompeii mine.	Small recorded production from 1922 to 1934. Callaghan, 1939, p. 185.
Oakland group(206)	N½ sec. 29, T. 28 S., R. 63 E.	Au	Quartz veins in andesite near contact with quartz monzonite intrusive.	No recorded production. Vanderburg, 1937, p. 78.
Phoenix mine (See Good Hope mine)				
Pompeii mine(201)	NE¼ sec. 22, T. 28 S., R. 63 E.	Au, Ag	Veinlets of vuggy quartz cementing a breccia in andesite porphyry. Veinlets contain gold and silver ore.	Small intermittent production from 1909 to 1935. Ransome, 1907, p. 74; Callaghan, 1939, p. 179-180.
Quartette mine(215)	Secs. 2 and 3, T. 29 S., R. 63 E.	Au, Ag, Cu	Geology same as Cyrus Noble mine. (pl. 8).	Production of more than \$2,800,000, largely produced before 1900. Some production until 1951. Main shaft 1,267 feet deep and underground workings totaling 5½ miles. Callaghan, 1939, p. 161.
Santa Fe mine(208)	Secs. 27 and 34, T. 28 S., R. 63 E.	Au, Ag	do.	No recorded production. Santa Fe shaft was Searchlight's source of water in 1922. Thompson, 1929, p. 720; Callaghan, 1939, p. 174.
Searchlight M & M mine(204)	Secs. 27 and 22, T. 28 S., R. 63 E.	Au	Ore in quartz vein and silicified andesite porphyry. Vein material is oxidized and low in grade.	Small production recorded, most recently in 1941. Callaghan, 1939, p. 176.
Searchlight Parallel mine(209)	NW¼ sec. 34, T. 28 S., R. 63 E.	Au, Ag	Geology same as Cyrus Noble mine.	Small production recorded from 1905 to 1918. Callaghan, 1939, p. 173-174.
Spokane mine (See Southern Nevada mine)				
Southern Nevada mine(205) (Spokane mine)	NE¼ sec. 27, T. 28 S., R. 63 E.	Au, Ag	do.	No recorded production. Ransome, 1907, p. 72; Callaghan, 1939, p. 174-176.
Virginian prospect(211)	W½ sec. 30, T. 28 S., R. 64 E.	Au(?)	Geology same as Boston mine.	No recorded production. Callaghan, 1939, p. 183-184.

Production of the Searchlight district from 1902 to 1962
(Data from Mineral Resources of the United States and Mineral Yearbook)

Year	Orp (tons)	Gold (ounces)	Silver (ounces)	Copper (pounds)	Lead (pounds)	Total Value
1902	10,910	6,147	1,175	0	0	\$ 127,676
1903	19,522	19,275	27,601	0	0	410,079
1904	16,750	18,400	13,498	0	0	388,068
1905	38,069	19,329	28,528	22,808	12,064	420,931
1906	45,668	25,145	11,543	11,182	9,655	530,227
1907	45,921	23,441	7,494	37,063	38,113	498,947
1908	52,193	13,137	10,883	14,954	44,857	281,199
1909	68,931	16,237	13,544	22,916	36,209	347,224
1910	27,331	10,406	11,489	93,848	45,847	235,237
1911	1,850	966	2,136	12,095	7,659	22,968
1912	4,158	2,237	2,562	10,126	10,032	49,942
1913	5,989	6,654	5,903	53,971	61,006	152,161
1914	3,057	3,999	2,855	5,556	21,919	85,830
1915	7,766	4,985	3,546	20,970	35,562	110,182
1916	6,322	3,903	4,340	24,392	9,951	90,220
1917	12,866	3,445	9,073	98,923	59,453	110,808
1918	1,700	2,649	8,395	44,477	77,863	79,670
1919	6,980	2,854	5,502	18,074	39,307	70,612
1920	2,131	3,432	5,275	44,941	91,436	91,287
1921	1,182	3,601	9,877	31,128	98,048	92,737
1922	1,441	1,661	5,024	12,847	44,375	43,540
1923	1,142	1,007	2,708	22,150	47,651	29,628
1924	850	830	1,267	5,801	46,050	22,453
1925	2,833	3,314	2,586	14,974	86,768	79,975
1926	1,881	1,879	1,720	7,430	81,977	47,522
1927	106	335	306	1,429	10,415	7,940
1928	77	224	252	2,968	9,464	5,573
1929	184	105	58	654	2,743	2,495
1930	124	19	27	0	0	411
1931	20,855	3,276	5,826	6,022	274,687	80,129
1932	2,973	2,018	4,853	4,353	355,458	54,031
1933	2,996	913	1,182	2,261	12,040	19,869
1934	6,701	1,746	8,478	2,237	4,951	67,140
1935	29,617	3,829	12,317	9,195	72,271	146,507
1936	16,705	6,403	36,116	5,580	53,857	255,061
1937	5,692	5,456	28,688	500	12,600	213,954
1938	4,646	4,066	6,871	3,000	9,400	147,478
1939	2,035	1,471	1,682	9,400	14,200	54,272
1940	3,565	3,815	6,462	18,000	14,000	140,854
1941	4,092	3,908	4,524	2,100	5,000	140,530
1942	1,017	897	2,205	0	200	32,976
1943	117	139	1,454	3,000	4,100	6,506
1944	52	21	308	5,200	2,100	1,824
1945	401	852	5,708	2,000	1,200	34,252
1946	393	785	5,937	6,000	4,000	33,680
1947	405	737	2,768	20,300	7,500	33,643
1948	13,436	1,582	1,487	7,800	100	58,427
1949	16,399	1,007	4,109	700	4,500	39,813
1950	18,967	1,620	4,152	1,700	600	60,892
1951	24,850	2,041	5,352	4,800	800	77,579
1952	14,466	547	2,405	5,800	2,400	27,663
1953	2,703	123	379	0	0	4,648
1954	1	4	2	0	0	142
1957	(1)					
1958	(1)					
1961	(1)					
1962	(1)					
Total	581,010	246,991	352,522	755,625	1,884,388	\$6,167,502

(1) Some small production reported but the actual amounts may not be disclosed.

Source: Longwell et al. 1965.

1. Mineral Area: Newberry
T.30 & 31S., R.64 & 65E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the area
of the subeconomic deposit.)
3. Commodity: The Newberry District is located in the southern Opal and
northern Newberry Mountains. It is about 4-5 miles west of Lake Mojave and
about 40 miles southeast of Searchlight. The area was mined as early as
the 1860s by soldiers from Fort Mojave, Arizona. The area has not been
actively mined since the 1930s.
4. Geologic and Other Technical Data: The veins of this District are generally
quartz with free gold or mixed copper-gold-silver-specular hematite ores. The
country rock is either pre-Cambrian granite, pre-Cambrian metamorphic rocks,
or sheared olivine basalt.
5. Current Activity: Exploration work is occurring, both drill hole and dump
sampling.
6. Access: Provided by existing mine roads.
7. Production Statistics: The following table summarizes the ore types and pro-
duction of the area.
8. Selected References:
Longwell et al. 1965.

APR 15 1961

Newberry
Overlay Key No. L-21

CRATER

Wash

Roman

Yellow Stone Mine

Christmas Tree Pass

Grapevine

Saratoga

Willow Spr

Spirit Mine

White Rock Mine

Foot P.

Recreation Area

Camp Thurman

USLM

Potential Mine

Empire Mine

Goldenrod Mine

Nellis

BOUNDARY

T305

R64E

APR 15 1981

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Newberry District

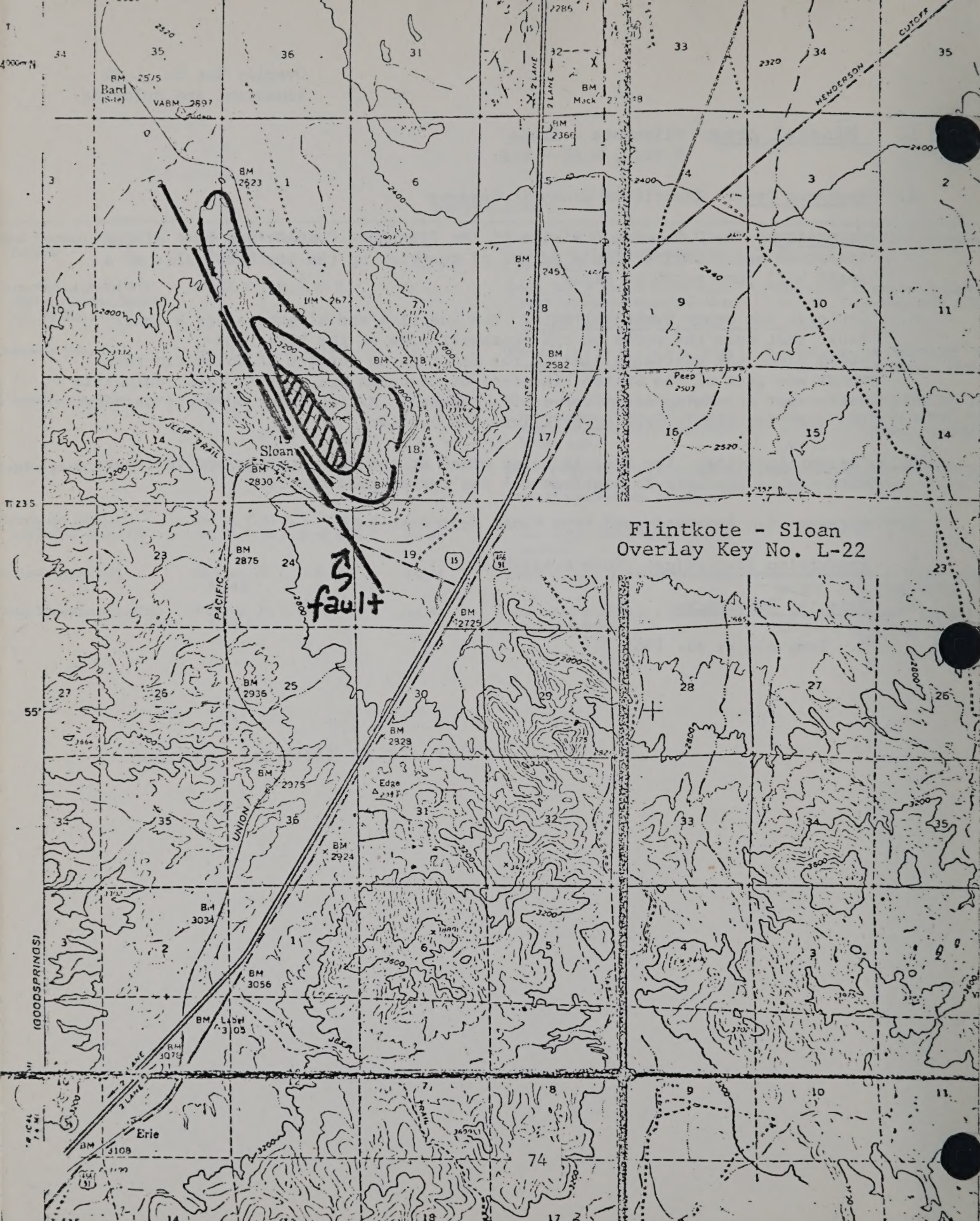
Black Mountain Mining Co.(196)	SE¼ sec. 25, T. 27 S., R. 64 E.	Au	Free gold in quartz veinlets in shear zone 6 to 12 feet wide cutting Precambrian(?) rocks.	No recorded production. Vanderburg, 1937, p. 76.
Camp Dupont group(197) (Includes Sazarac, Bornite, and Big Shot claims)	Sec. 29, T. 27 S., R. 65 E.	Au	Quartz vein in sheared olivine basalt. Some high-grade copper-gold-silver ore mixed with specular iron reported.	Production of 35 tons of ore reported in 1936. Vanderburg, 1937, p. 78.
Goldenrod group(235)	Sec. 28, T. 30 S., R. 65 E.	Au	Free gold in a quartz vein 6 to 18 feet wide in Precambrian granite.	Recorded production about \$3,500. Total production not known. Vanderburg, 1937, p. 76.
Homestake group(239)	SW¼ sec. 35, T. 31 S., R. 66 E.	Au, Ag	Three parallel fissure veins in Precambrian granite. Values chiefly in gold with some silver. Main vein averages 12 feet wide.	Production estimated at \$150,000. Discovered in 1860's by soldiers from Fort Mojave, Arizona. Vanderburg, 1937, p. 77.
Jackdaw group(234)	Sec. 21, T. 30 S., R. 65 E. u	Ag	Silver values in quartz vein cutting Precambrian granite. Malachite and azurite associated with the silver.	Production estimated at \$15,000 in shipping ore. Vanderburg, 1937, p. 76-77.
Cottonwood mine(236) and Juniper mine(237)	Sec. 18, T. 31 S., R. 65 E. u Sec. 30, T. 31 S., R. 65 E. u	Au, Ag Au, Ag	Quartz veins in Precambrian metamorphic rocks. Some sulfide minerals reported.	No recorded production.
St. Louis group(199)	SE¼ sec. 32, T. 27 S., R. 64 E.	Au, Ag	Quartz veins(?) in Precambrian rocks.	Recorded production (1936) equals \$22,000. Vanderburg, 1937, p. 77.
Wiley Inspiration mine(238)	NE¼ sec. 34, T. 31 S., R. 66 E.	Au, Ag	Gold and silver values in a mineralized zone in andesite(?).	No recorded production. Explored by 530 feet of underground workings.

Source: Longwell et al. 1965.

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1. Mineral Area: Flintkote - Sloan
T.22S., R.60 - 61E.
2. Economic Type: Identified Economic Reserve
3. Commodity: The U.S. Lime Division of the Flintkote Company has been mining limestone and dolomite from a series of quarries on the southwest side of a small hill just north of Sloan.
4. Geologic and Other Technical Data: The quarries are aligned along a small fault that cuts the rocks on the southwest side of the hill. Exposed along the northeast side of the fault is an outlier of dolomitic rocks which are part of the Sultan Limestone of Devonian age. It is these dolomitic rocks that are being mined for use in cements. Mining is by open-pit methods, the quarries slowly working back into the outlier.
5. Current Activity: The area is being mined at the present time and the operation can be expected to continue for the foreseeable future.
6. Access: Via improved road from Sloan exit from I-15.
7. Production Statistics: None available.
8. Selected References:
 1. Longwell et al. 1965.

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Overlay Key No. L-23
lead, silver, gold,
uranium, manganese,
barite, alunite, perlite

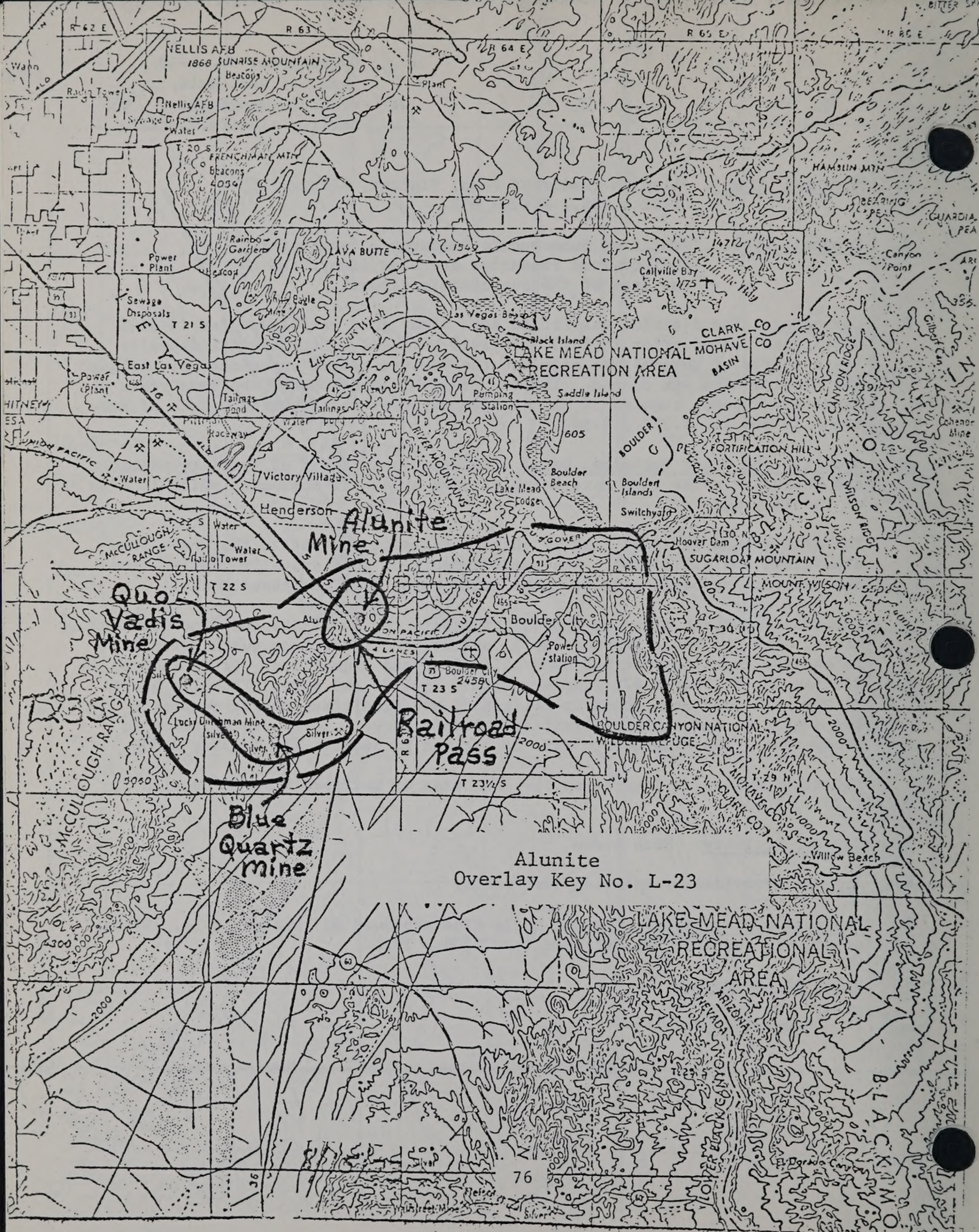
1. Mineral Area : Alunite (Railroad Pass, Vincent, Klinger)
T.22 & 23S., R.62 - 65E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in
the area of the subeconomic deposit.)
3. Commodity: The district was formed soon after gold was discovered in 1908.
Operations ceased prior to 1915. In 1915 interest in the alunite deposits
(as a source of potash) was high but the venture proved unsuccessful, although
the Alunite Mine was opened. The Quo Vadis Mine was opened the same year. A
manganese deposit running 5% Mn has been reported in the north halves of Sec-
tions 23 and 24, T.23S., R.64E.
4. Geologic and Other Technical Data: The area is composed of Tertiary volcanic
and extrusive rocks that have been intruded by quartz monzonite which is also
of Tertiary age.

The area around Railroad Pass is chiefly andesite and latite that have been
alunitized and silicified. The small amounts of gold and silver mined from
the district probably came from the small veins that cut these rocks.

The most important mines in the district were the Quo Vadis and Blue Quartz
Mines. The Quo Vadis produced gold, silver, and lead, from quartz veinlets
in sheared andesite that had been silicified and alunitized. It is located in
Section 13, T.23S., R.62E. and was active in 1935 and 1936. The Blue Quartz
Mine worked gold ores found in silicified and alunitized quartz monzonite
and overlying andesitic and latitic volcanic rocks. There was no recorded
production. The Blue Quartz Mine is located in Section 28, T.23S., R.63E.

The Alunite Mine is located on the east side of Railroad Pass in Section 2,
T.23S., R.63E.

5. Current Activity: None known.
6. Access: Provided by existing dirt roads.
7. Production Statistics: The Quo Vadis Mine produced 925 ozs. of gold, 749 ozs.
of silver, and 1832 lbs. of lead from 1908 - 1915.
8. Selected References:
 1. Longwell et al. 1965.



Overlay Key No. L-24
lead, molybdenum, zinc,
silver

1. Mineral Area: Charleston
T.18 - 19S., R.55 - 56E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the
area of the subeconomic deposit.)
3. Commodity: Little is known about the history of the Charleston District.
Some lead and zinc ore was apparently shipped between 1926 and 1929.
Some silver and lead was shipped in 1953 and 1954. Some additional de-
velopment occurred between 1955 and 1956.
4. Geologic and Other Technical Data: The chief properties in the district
were the Lucky Strike Mine, the Griffith Mine, the Ada and Edith Claims,
and the Iron Age Mine. All except the Iron Age Mine worked galena ores
found in Paleozoic limestones. The Iron Age Mine mined an iron gossan.
Molybdenum has been reported in the district.
5. Current Activity: None.
6. Access: Existing roads.
7. Production Statistics: Total value less than \$10,000 (1956 dollars).
No other quantifications available.
8. Selected References:
Longwell et al. 1965.

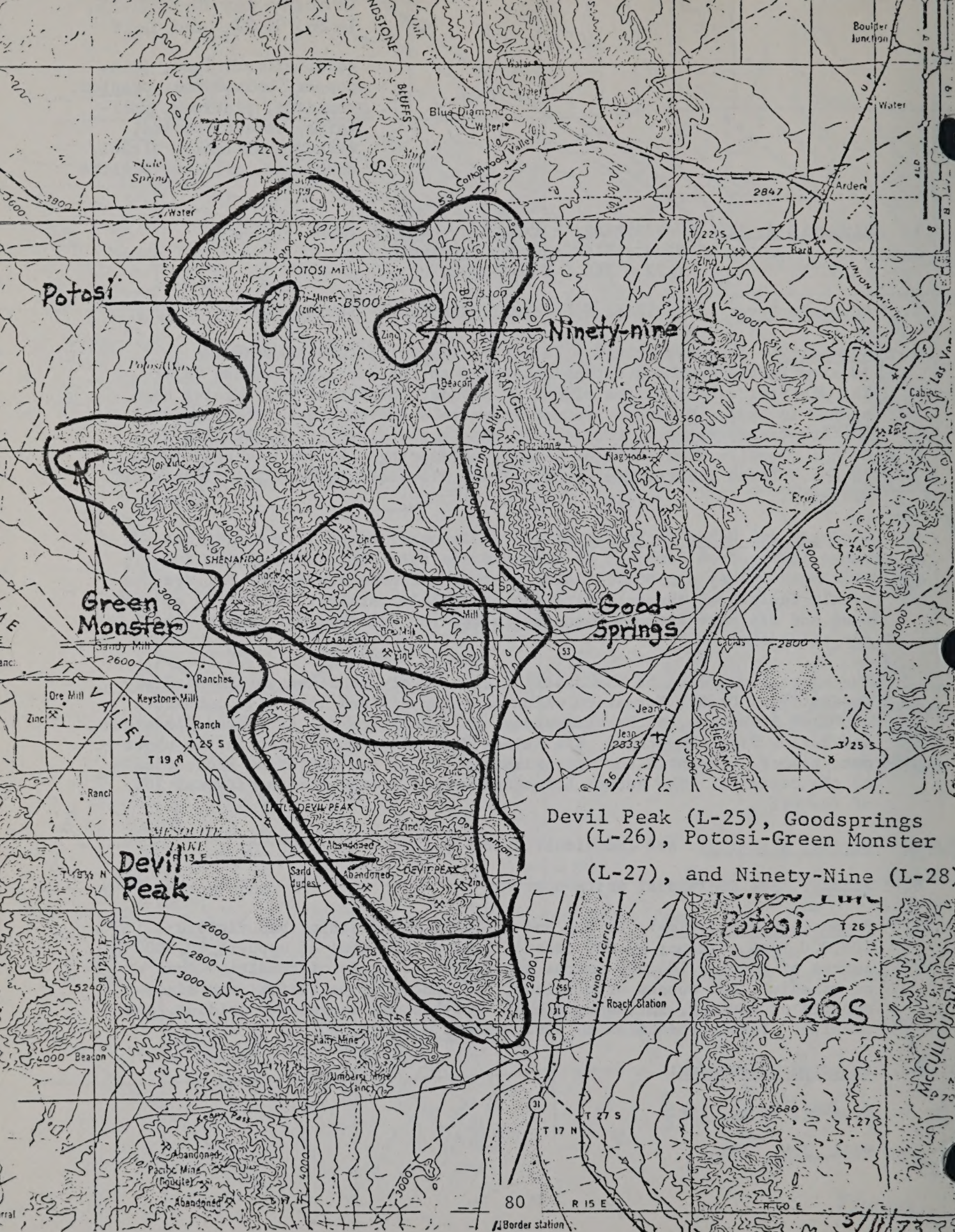
gold, silver, lead, zinc,
copper, molybdenum, uranium,
vanadium, platinum, pall-
adium, cobalt, barite,
mercury, antimony, nickel,
manganese, iridium, perlite

1. Mineral Area: Goodsprings - Potosi - Devil Peak -
Ninety-Nine - Green Monster
T.22 - 26S., R.56 - 59E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
3. Commodity: The Goodsprings - Yellow Pine - Potosi mining district is located in the southern Spring Mountains to the southwest of Las Vegas. The district is one of the oldest in Nevada, the Potosi Mine having been opened in 1857. Minerals are not known to occur throughout the district, but are concentrated in four areas, namely the Ninety-Nine (Overlay No. L-28), Potosi - Green Monster (L-27), Goodsprings (L-26), and Devil Peak (L-25). These mineralized areas will be discussed in detail in individual writeups.
4. Geologic and Other Technical Data: Sedimentary rocks in the district range in age from Cambrian to Jurassic and total more than 11,000 feet in thickness. They dip homoclinally westward at moderate angles but are complexly faulted by thrust faults that generally parallel the strike of the beds and dip more steeply than the rocks. Numerous normal faults also cut the rocks.

The mineral deposits of the district are largely confined to the Mississippian Monte Cristo Formation which has been divided into five members: the Dawn Limestone, Anchor Limestone, Bullion Dolomite, Arrowhead Limestone, and Yellow Pine Limestone. The Yellow Pine Limestone, which is the uppermost member, accounted for approximately 85% of the lead-zinc production of the district. The Anchor Limestone member produced an additional 10% of the ore.
5. Current Activity: See individual write-ups.
6. Access: See individual write-ups.
7. Production Statistics: By the end of 1962, the district had yielded 109,000 tons of zinc; 47,000 tons of lead; 2,500 tons of copper; 90,500 ounces of gold; 2,103,000 ounces of silver; 5.5 tons of cobalt; 4 tons of vanadium; 506 ounces of platinum; 762 ounces of palladium; and minor amounts of mercury, antimony, nickel, molybdenum, manganese, iridium, and uranium. Total production to 1962 exceeds \$31,000,000.
8. Selected References:

Longwell et al. 1965.

Hill, J.M. 1914.



Devil Peak (L-25), Goodsprings
(L-26), Potosi-Green Monster
(L-27), and Ninety-Nine (L-28)

1. Mineral Area: Devil Peak
T.25 & 26S., R.57 & 58E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
3. Commodity: The history of the Devil Peak area is similar to that of the Goodsprings area. Major production was from 1895 to World War II but this production was intermittent over this time period. Zinc, lead, and silver were the major metals produced. Gold and copper were of secondary importance.
4. Geologic and Other Technical Data: The mines in the Devil's Peak area are typified by two mines, the Sultan and the Root, which were also the largest producers.

The ore bodies were in a zone of brecciated dolomite along the Sultan thrust fault and along high-angle faults that cut the breccia zone. The Sultan thrust cuts across the Sultan, Monte Cristo, and Bird Spring Formations. The ore was composed of hydrozincite, cerussite, calamine, and galena. Anomalous radioactivity was reported in associated copper and oxides.

The Root Mine worked ores that were similar to those of the Sultan Mine and the environment of the ore appears to be quite similar to that of the Sultan except that it occurs only in the Yellow Pine member of the Monte Cristo Formation.

Most of the other mines in the area produced smaller quantities of ore but were producing from ores similar to those found at the Sultan and Root Mines. The Monte Cristo Mine and the Spelter Mine, however, were somewhat different.

At the Monte Cristo mine a "J" shaped ore body in dolomitized Monte Cristo rocks about 280 feet long, 40 feet wide, and 8 to 20 feet thick was mined. The ore was nearly pure smithsonite at one end and nearly pure calamine and hydrozincite at the other end. There is no recorded production from the Spelter mine but it is of interest because the ore was predominantly lead minerals with subordinate vanadium.

5. Current Activity: Minor amounts of prospecting and exploration.
6. Access: Via existing dirt roads.

7. Production Statistics:

	<u>Sultan Mine (1)</u>	<u>Root Mine (2)</u>	<u>Monte Cristo (3)</u>
Zinc (lbs)	2,898,648	3,896,057	6,386,802
Lead (lbs)	2,615,877	858,055	- -
Silver (ozs)	98,543	20,782	- -
Copper (lbs)	7,067	44,002	- -
Gold (ozs)	30	27	- -

(1) Produced intermittently from 1910 - 1952.

(2) Produced intermittently from 1893 - 1952.

(3) Produced from 1908 - 1919.

8. Selected References:

Longwell et al. 1965.

Overlay Key No. L-26
zinc, lead, silver, copper,
uranium, gold, platinum,
cobalt, vanadium, palladium,
mercury, molybdenum

1. Mineral Area: Goodsprings
T.24 & 25S., R.57 & 58E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the area
of the subeconomic deposit.)
3. Commodity: Mining in the vicinity of the town of Goodsprings began
some time prior to 1893. From 1893 to 1905 mining was largely con-
fined to the Keystone, Boss, and Clementina mines. The principal
metal mined was gold. In 1906, the recognition of the valuable
zinc ores and the completion of the San Pedro, Los Angeles and Salt
Lake Railroad stimulated new mining and the area became the largest
producer of zinc in Nevada. The peak of production was reached
during World War I. This was followed by a period of in-
activity that lasted until 1923. Between 1924 and 1928 there was
a flurry of activity after which the area again became dormant.
During World War II, many of the mines were reopened but activity
ceased soon after the war ended. The area has been dormant since
then.
4. Geologic and Other Technical Data: The area and ore bodies are
typified by the Yellow Pine Mine, which exploited lead-zinc deposits
in the Yellow Pine Limestone, Arrowhead Limestone, and Bullion Dolo-
mite. Ore bodies ranged from 10 to 40 feet in thickness and extended
from 50 to 300 feet down dip, and more than 2,000 feet along the
strike. The Yellow Pine and Prairie Flower mines were connected under-
ground and operated as one mine.

The most abundant mineral was hydrozincite, but calamine, smithsonite,
and galena were widespread, and cerussite and anglesite were common.
Small amounts of carbonates, sulfates and silicates of zinc, lead and
copper were also found.

Radioactive materials were found in the form of porous, massive, siliceous
limonite with small amounts of malachite and chrysocolla. Up to 0.017% of
 U_3O_8 was found in some samples.

As with the Green Monster mine, the uranium seems to be associated with
copper mineralization. Annabergite ($Ni_3(AsO_4)_2 \cdot 8H_2O$) and stibnite
(Sb_2S_3) were also found but both were rare.

While the Yellow Pine Mine is typical of the mines and ores of the area,
several mines show interesting variations. These typical mines are as
follows:

Boss Mine: The ore body is along a minor fault zone
related to the Keystone Thrust Fault separating the Sultan
Limestone from the Monte Cristo Limestone. Ore minerals
are platiniferous plumbojarosite and copper carbonates and
silicates. Anomalous radioactivity was noted in limonite
lenses surrounded by chrysocolla halos.

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As can be seen, the lead-zinc mineralization that is typical of the area is absent or subordinate at the Boss Mine. Instead there is an anomalous concentration of noble metals in the ores, and also a good deal more copper.

Shenandoah Mine: Generally similar to the Yellow Pine Mine but wulfenite (PbMoO_4) is much more common than at other mines.

Oro Amigo Mine: Similar to the Yellow Pine Mine but the ore contains cobalt.

Keystone Mine: Ore is along a contact between a porphyry dike and dolomite of the Bird Spring Formation. The ore was higher in gold than was typical of the area.

Kirby Mine: Similar to the Yellow Pine Mine but containing alunite.

Argentina Mine: Similar to the Yellow Pine Mine but containing vanadium.

Fredrickson Mine: Similar to the Yellow Pine Mine but containing cinnabar and vanadium.

Belle Mine: Silicified shear zone in the Bird Spring Formation containing manganese oxides, chrysocolla, and yellow vanadate. No recorded production.

Green Copper Mine: Copper carbonates and silicates in a shear zone in dolomitized Anchor Limestone. Produced 75 tons of ore averaging 15% to 20% copper.

Pilgrim Mine: Similar to the Yellow Pine Mine but containing wulfenite and pyromorphite.

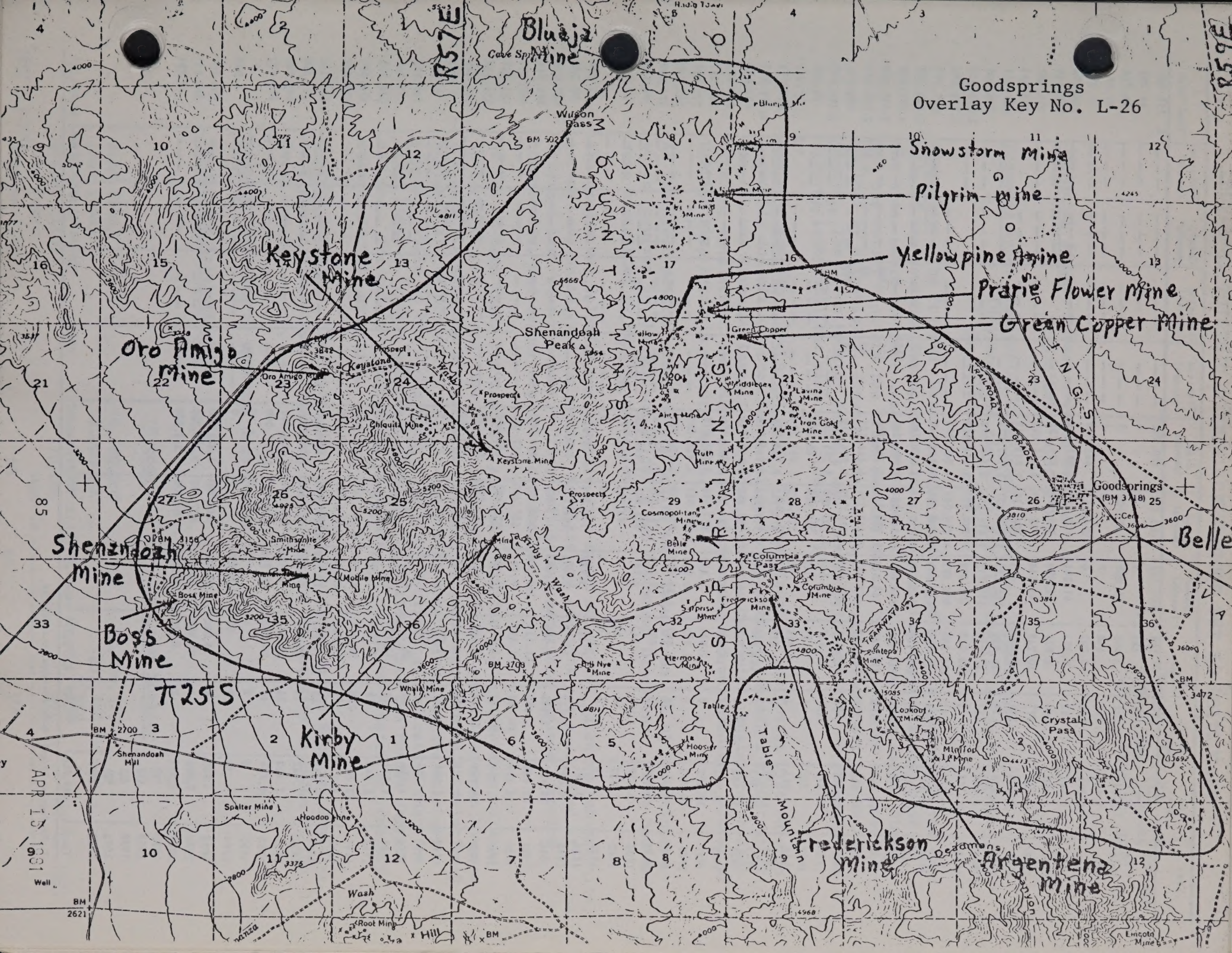
Snowstorm Mine: Ore zone is a dolomite breccia cemented by malachite, that parallels the bedding in the Bullion Dolomite. A 12 to 18 inch barite vein is exposed in the workings.

Bluejay Mine: Similar to the Yellow Pine Mine, but produced 78 lbs. of cobalt.

5. Current Activity: Minor exploration work.
6. Access: Via existing improved and unimproved roads.
7. Production Statistics: See the following table for detailed information.
8. Selected References:

Longwell et al. 1965.

Goodsprings
Overlay Key No. L-26



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PRODUCTION OF THE GOODSPRINGS MINING DISTRICT 1856-1962

Year	Ore (tons)	Gold (ounces)	Silver (ounces)	Copper (pounds)	Lead (pounds)	Zinc (pounds)	Platinum (ounces)	Palladium (ounces)	Cobalt (pounds)	Vanadium (pounds)	Total Value
1856-1901	6,303	11,837	17,809	952,108	462,172	390,912	---	---	---	---	\$ 855,507
1902	2,078	2,137	342	0	0	0	---	---	---	---	44,355
1903	2,092	2,583	695	21,800	28,000	0	---	---	---	---	56,726
1904	1,929	2,316	146	0	0	0	---	---	---	---	47,960
1905	2,394	726	3,707	0	290,063	685,659	---	---	---	---	71,300
1906	9,481	443	1,573	67,341	625,175	2,885,246	---	---	---	---	234,550
1907	4,400	364	2,976	92,690	172,800	1,878,732	---	---	---	---	148,039
1908	4,627	377	10,247	42,144	720,285	1,115,851	---	---	---	---	101,482
1909	8,664	278	18,461	392	406,353	3,013,352	---	---	---	---	195,585
1910	5,878	59	16,826	122,925	1,263,837	2,707,071	---	---	---	---	227,707
1911	8,677	117	47,072	173,719	1,617,224	3,548,032	---	---	---	---	324,100
1912	28,386	2	223,013	103,398	6,544,917	13,254,860	---	---	---	---	1,363,354
1913	29,060	61	192,339	283,592	6,204,065	14,363,704	---	---	---	---	1,239,084
1914	24,537	389	122,703	156,389	4,185,208	11,862,149	110	---	---	---	877,253
1915	38,391	40	100,146	262,600	4,620,243	21,061,182	---	---	---	---	2,926,300
1916	71,155	693	156,492	494,604	8,349,850	28,889,282	182	---	---	---	4,697,929
1917	64,260	515	219,789	764,733	9,298,706	20,535,768	138	355	---	---	3,348,134
1918	40,614	236	140,211	400,792	6,459,836	15,444,751	42	36	---	6,667	2,120,065
1919	19,273	564	139,656	130,395	4,217,739	5,974,219	34	203	---	---	882,548
1920	18,611	158	96,557	76,567	3,927,280	9,381,503	---	---	3,941	---	1,196,692
1921	287	1	2,195	119	186,169	69,397	---	---	7,114	---	15,506
1922	1,861	1	6,618	52	316,125	891,174	---	---	---	770	77,460
1923	14,758	5	31,678	1,855	1,472,113	8,755,427	---	---	---	---	725,075
1924	21,383	7	123,650	16,267	7,710,851	7,909,042	---	---	---	---	1,216,077
1925	20,435	14	72,045	6,900	5,287,587	6,230,644	---	---	---	---	984,827
1926	8,931	15	19,549	10,994	1,904,766	2,181,686	---	---	---	---	330,071
1927	10,192	6	12,619	7,523	1,652,186	3,546,078	---	---	---	---	339,311
1928	10,745	7	25,793	43,955	2,209,087	1,425,285	---	---	---	---	236,627
1929	4,614	23	11,067	33,382	1,070,718	1,236,702	---	---	---	---	161,320
1930	6,984	72	1,031	18,065	965,226	2,474,323	---	---	---	---	171,269
1931	3,759	136	341	2,865	518,086	1,899,328	---	---	---	---	94,520
1932	721	98	16	0	94,795	254,795	---	---	---	---	12,500
1933	0	0	0	0	0	0	---	---	---	---	---
1934	5,261	989	1,437	4,982	138,405	28,635	---	---	---	---	42,256
1935	9,852	2,012	3,072	8,435	156,013	159,380	---	---	---	---	80,239
1936	13,833	4,411	1,386	35,494	429	0	---	---	---	811	159,054
1937	32,638	7,690	11,114	155,300	603,600	606,000	---	---	---	---	371,564
1938	26,450	10,348	1,597	19,100	537,400	1,052,000	---	---	---	---	440,301
1939	41,154	10,375	3,089	25,300	378,900	696,000	---	---	---	---	421,853
1940	35,899	7,263	3,198	4,000	364,300	876,000	---	---	---	---	330,334
1941	10,073	1,751	4,510	1,100	268,900	860,000	---	---	---	---	144,449
1942	1,266	17	1,267	0	0	0	---	---	---	---	793
1943	152	0	149	0	49,900	60,000	---	---	---	---	10,329
1944	4,958	53	28,772	62,800	793,900	1,364,000	---	---	---	---	249,801
1945	8,227	41	35,924	28,000	1,030,000	1,750,000	---	---	---	---	321,348
1946	8,645	65	29,505	56,000	728,000	1,588,000	---	---	---	---	308,275
1947	13,507	985	28,434	45,700	1,172,500	1,450,000	---	---	---	---	414,095
1948	8,132	77	21,089	33,600	1,503,900	867,300	---	---	---	---	413,622
1949	5,436	42	19,954	13,300	1,160,800	894,800	---	---	---	---	316,510
1950	3,662	25	12,515	4,000	367,800	1,286,500	---	---	---	---	245,669
1951	7,413	28	19,048	2,100	514,900	2,664,300	---	---	---	---	592,708
1952	10,746	40	20,795	49,900	656,800	2,927,000	---	---	---	---	623,923
1953	6	2	1	0	0	0	---	---	---	---	71
1954	38	0	30	3,500	0	0	---	---	---	---	1,059
1955 ¹	4,943	8	13,040	23,600	344,300	1,431,800	---	---	---	---	248,297
1956 ¹	9,562	1	22,807	24,600	527,600	3,205,700	---	---	---	---	553,145
1957 ¹	1,333	5	2,230	37,400	63,200	213,300	---	---	---	---	47,231
1958	(2)						---	---	---	---	
1959	(2)						---	---	---	---	
1960	(2)						---	---	---	---	
1961	(2)						---	---	---	---	
1962	(2)						---	---	---	---	
Total	759,266	90,508	2,102,325	4,926,377	94,125,809	217,846,867	306	762	11,055	8,248	31,660,221

1. Production largely from government stockpile.

2. Some small production but actual amounts may not be disclosed.

1. Mineral Area: Potosi - Green Monster
T.23 & 24S., R.56 & 57E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the area
of the subeconomic deposit.)
3. Commodity: The Potosi - Green Monster mineralized area is located on the west
side of the southern Spring Mountains. Two isolated mineral zones occur in
the area. Both of these zones have been exploited by one mine each. These
are the Potosi Mine and the Green Monster Mine. The Potosi Mine was opened
in 1857 by Nathaniel V. Jones at the behest of Brigham Young and the Mormon
Church. The Green Monster deposit was located prior to 1895. Production was
intermittent until the mine was closed in 1951.
4. Geologic and Other Technical Data: The ores found at the Potosi Mine were in
partially dolomitized brecciated Yellow Pine Limestone beneath a thrust sheet.
The ore was composed largely of galena with some cerussite, anglesite, hydro-
zincite, sphalerite, and minor amounts of calamine and smithsonite. Traces of
uranium also occur in the ore zones.

At the Green Monster mine the ore bodies were tabular bodies of hydrozincite
which occurred in the Bullion Dolomite and Arrowhead Limestone. These bodies
were brecciated by bedding plane faults.

The gangue was dolomite and limonite with small amounts of calamine, smithsonite,
galena, anglesite, and cerussite. Kasolite and dumonite are associated with some
oxidized lead-zinc minerals. Other radioactive materials include limonite,
chrysocolla, and copper-stained hydrozincite.

As can be seen these two deposits are quite similar and are probably related
in terms of origin and time of emplacement. There are two differences however.
The main ore minerals are different at the two mines and uranium is relatively
enriched at the Green Monster. At the Potosi mine galena was the main ore
mineral, while at the Green Monster it was hydrozincite, indicating that the
Green Monster deposit underwent extensive oxidation while the Potosi deposit
did not. The relative enrichment of uranium at the Green Monster is probably
related to this oxidation.

5. Current Activity: The Potosi Mine has been nominated to the National Register
of Historic Sites thus eliminating any activity. No activity is known at the
Green Monster.
6. Access: Provided by existing dirt roads.
7. Production Statistics:

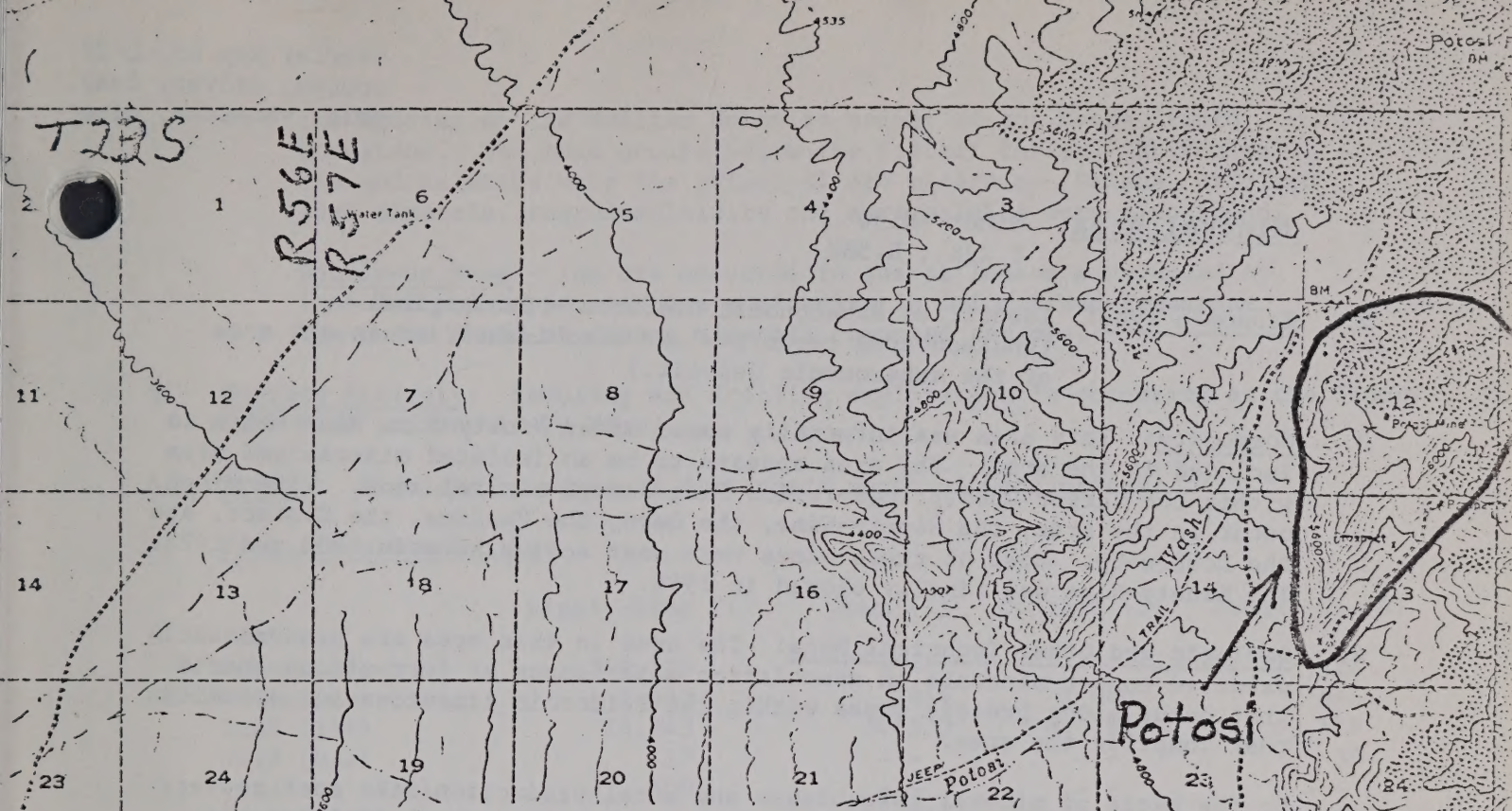
	<u>Potosi</u>	<u>Green Monster</u>
zinc (lbs)	44,180,000	2,130,620
lead (lbs)	3,000,000	251,735
silver (ozs)	40,647	7,948
copper (lbs)	278,000	824
gold (ozs)	24	- -
uranium (lbs)	- -	109

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8. Selected References:

1. Longwell et al. 1965.

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Potosi - Green Monster
Overlay Key No. L-27



1. Mineral Area: Ninety-Nine
T.23S., R.58E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the area
of the subeconomic deposit.)
3. Commodity: This area was informally named after Ninety-Nine Mine which is
included in the area. The area appears to be an isolated mineralized area
within the larger Goodsprings-Yellow Pine-Potosi mineral zone. Five mines
occur in the area, the Ninety-Nine, the Dawn, the Pauline, the Contact, and
the Double-Up. Most of these mines were most active between 1900 and 1925.
The Ninety-Nine was finally closed in 1946.
4. Geologic and Other Technical Data: The ores in this area are predominantly
oxidized copper minerals in association with lenses of ferruginous cherts
that occur along breccia zones within the Paleozoic limestone and dolomites
that comprise the area.

On the basis of mineral assemblages and metal production, the area appears
to be divided into two ore types. The northern type which includes the
Ninety-Nine and Double-Up mines is characterized by abundant copper mineral-
ization, some gold, and no zinc. The southern zone has zinc but no gold or
copper. The Pauline Mine apparently straddles the two types in that both
copper and zinc have been reported.

Ninety-Nine Mine - This deposit was first located in 1894,
abandoned, and relocated in 1899. It was operated inter-
mittently until 1914. It was reopened briefly from 1944 to
1946 and has been inactive since then.

The ore is mostly oxidized copper minerals in or associated
with red ferruginous cherts that occur as lenses in a breccia
zone that cuts the Bullion Dolomite Member of the Monte Cristo
Limestone. Malachite and azurite are the commonest oxidized
copper minerals at the mine. Highgrade chalcocite pockets
that yielded up to three tons of ore were reported to occur
at the 400 foot level. Cuprodescloizite and manganese oxides
have been reported along bedding planes in the Monte Cristo in
the area of the mine.

Dawn Mine - The chief ore minerals were hydrozincite with some
calamine and galena, which was localized in a breccia zone with-
in the Bullion Dolomite.

Pauline Mine - Lead, zinc, and copper minerals were mined from
a zone cutting the dolomitized Yellow Pine Limestone Member of
the Monte Cristo Limestone. Cuprodescloizite was reportedly
abundant at the mine. There was no recorded production from the
mine but some ore was shipped.

Contact Mine - The ore zone was a dolomite breccia parallel to

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the bedding of the Bullion Dolomite Member of the Monte Cristo Limestone. The zone occurs below the Contact Thrust. Hydrozincite and calamine were the principal ore minerals. Galena, oxidized lead minerals, cuprodescloizite and aurichalcite were also found.

Double-Up Mine - The ore occurred in quartz lenses surrounded by limonite and copper carbonate minerals in dolomitized limestone. The outer shell of copper minerals composed the ore.

5. Current Activity: Sampling and drilling exploration is occurring at the Ninety-Nine Mine and Double-Up Mine.

6. Access: Provided by numerous dirt roads north of Goodsprings.

7. Production Statistics:

	Ninety-Nine (1)	Dawn (2)	Contact (3)	Double-Up (4)
Copper (lbs)	544,129	- -	- -	75,117
Silver (ozs)	6,685	844	1,040	641
Lead (lbs)	16,243	74,520	64,797	3,118
Gold (ozs)	17	- -	- -	35
Vanadium (lbs)	500	- -	- -	- -
Zinc (lbs)	- -	61,889	319,430	34,722

(1) 1903-1946

(2) 1917-1920

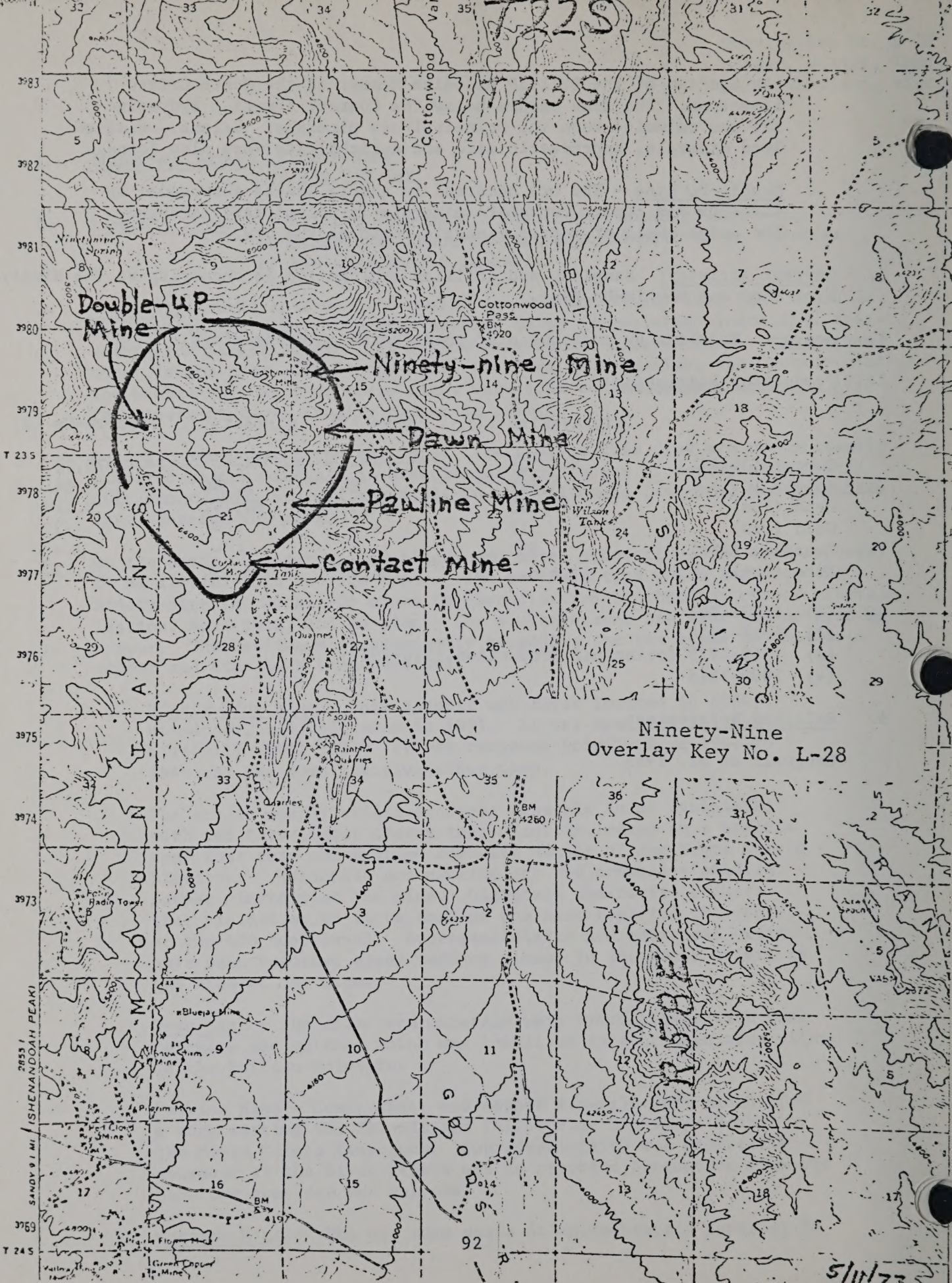
(3) 1912-1925 (principal production 1916-1917)

(4) 1900-1918

8. Selected References:

Longwell et al. 1965.

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Ninety-Nine
Overlay Key No. L-28

5/11/73
APR 15 1981

1. Mineral Area: White Beauty (Longo)
Sec. 27 & 34, T.19S., R.58E.
Sec. 3, T.20S., R.58E
2. Economic Type: Identified Subeconomic Resource - Paramarginal
3. Commodity: White Beauty is an unofficial name given to a series of gypsum mining claims located at the northern end of the Spring Mountain Gypsum Area. These claims are located to the northwest of Las Vegas, about $\frac{1}{2}$ mile south of Kyle Canyon Road.

Mining began in March, 1972, and a small grinding plant had been set up on the claims. The gypsum being mined is of good quality and the locators are planning to mine, process, bag, and sell the gypsum as a soil conditioner in the Las Vegas area. A potential market for such materials exists in the area, but the initial costs of establishing the company and the product in the face of competition from existing companies makes the operation a tenuous one. Should the product and market be established, the mine will probably remain active for many years. It is likely, however, that the mine will be operated intermittently during the year to supply peak demands for gypsum.

This operation has received adverse publicity in the newspapers and inquiries from irate landowners on Kyle Canyon Road who are afraid that the operation will cause air pollution. Local homeowners also did not like the idea of heavy trucks using Kyle Canyon Road. The locators have made every attempt to lessen the dust problem, including covering their conveyor belts, crushers, etc. Continuing protest can be expected, however.

4. Geologic and Other Technical Data: The White Beauty gypsum deposit occurs as beds in rocks of Mississippian to Permian age. The three most important beds have been measured and have an outcrop length of 4,200 feet along the strike. The center portions of these beds are 2,800 feet in length and consistently over 900 feet wide. The thickness varies considerably but in the central portion the three main beds average 30 to 50 feet thick. Total potential gypsum reserves are calculated at 36 million tons with indicated reserves of 14 million tons. The gypsum itself is massive with a sugary texture. It is very clean and has few impurities. Assays of this deposit indicated that it contains 93.37% to 99.77% gypsum, with no boron, arsenic, antimony or molybdenum detected.
5. Current Activity: In 1979, mineral patent application N-27611 was filed with the Nevada State Office BLM, and was referred to the Las Vegas District Office for mineral report.
6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References:
 1. Olsen 1964.

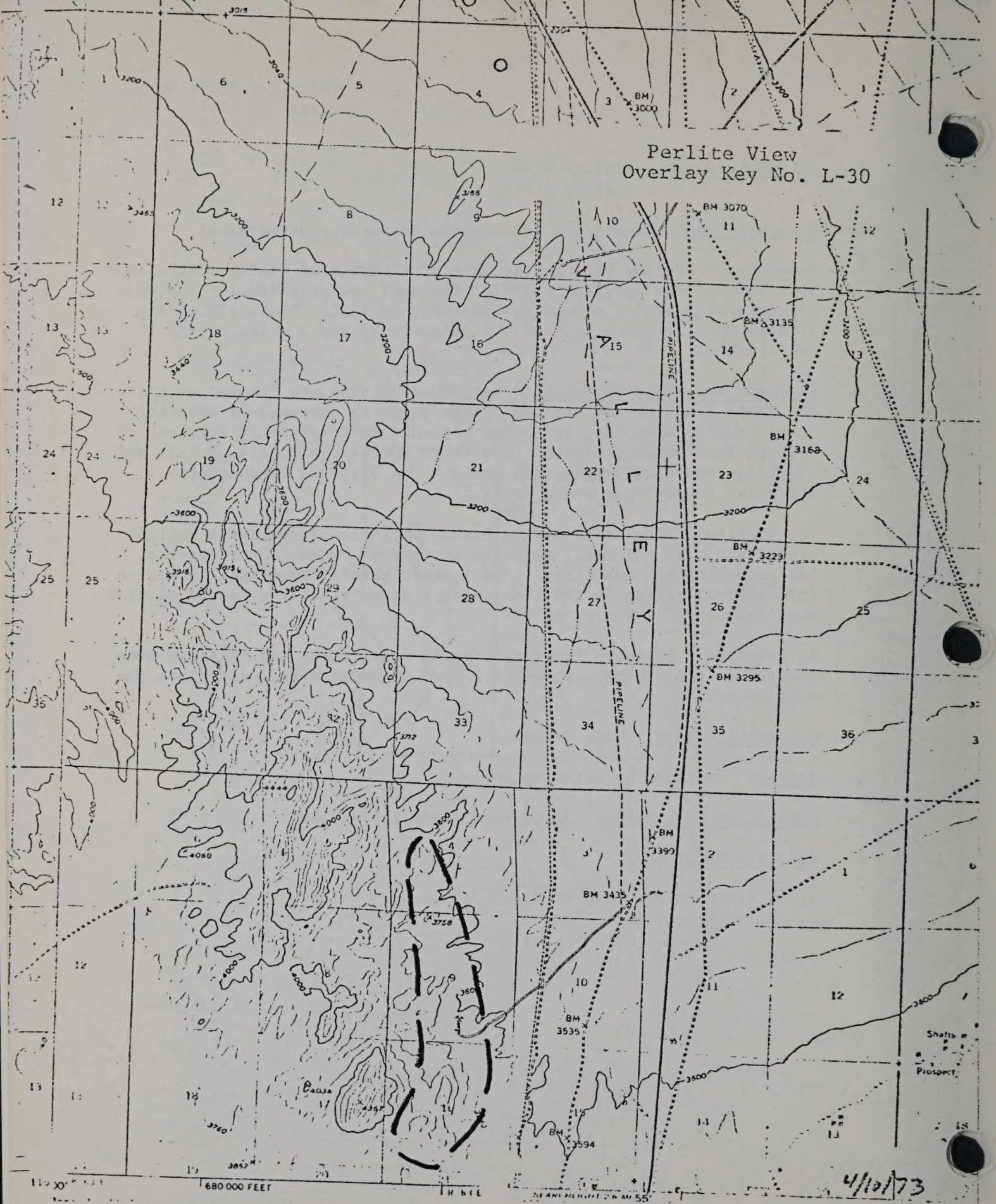
1. Mineral Area: Perlite View
T.28S., R.63E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
3. Commodity: Perlite View is the name of a series of mining claims that were located for perlite in 1953. The mine was operated for a number of years at a profit and became inactive in 1958. These claims are located about 2 miles west of U.S. Highway 95 and 3 miles north of Searchlight.
4. Geologic and Other Technical Data: These claims are located on the southeast flank of the Highland Range which is composed of andesite flows, tuffs, breccias, and other volcanic rock types, of Tertiary or perhaps late Cretaceous age. The rocks on the claims are perlite and rhyolitic ash that varies from granular to vitreous in character. The color ranges from white to black.

The quality of the materials is highly variable. Impurities include bentonitic clay and small rhyolite stringers. Much of the material has poor bloating qualities. The locator blended several lithologies from several claims in order to produce an acceptable grade of bloated perlite.

At one time a bloating furnace, several separators, and crushers were located on the claims. These have been dismantled and sold since the mine closed.

5. Current Activity: None known.
6. Access: Provided by existing roads.
7. Production Statistics: 3,150 tons, from 1953-1958.
8. Selected References:
 1. U.S.G.S. & Nev. Bur of Mines. 1964.
 2. Sulenski 1972.

Perlite View
Overlay Key No. L-30



Overlay Key No. L-31
gold, silver, lead,
zinc, molybdenum, copper,
beryllium, fluorspar

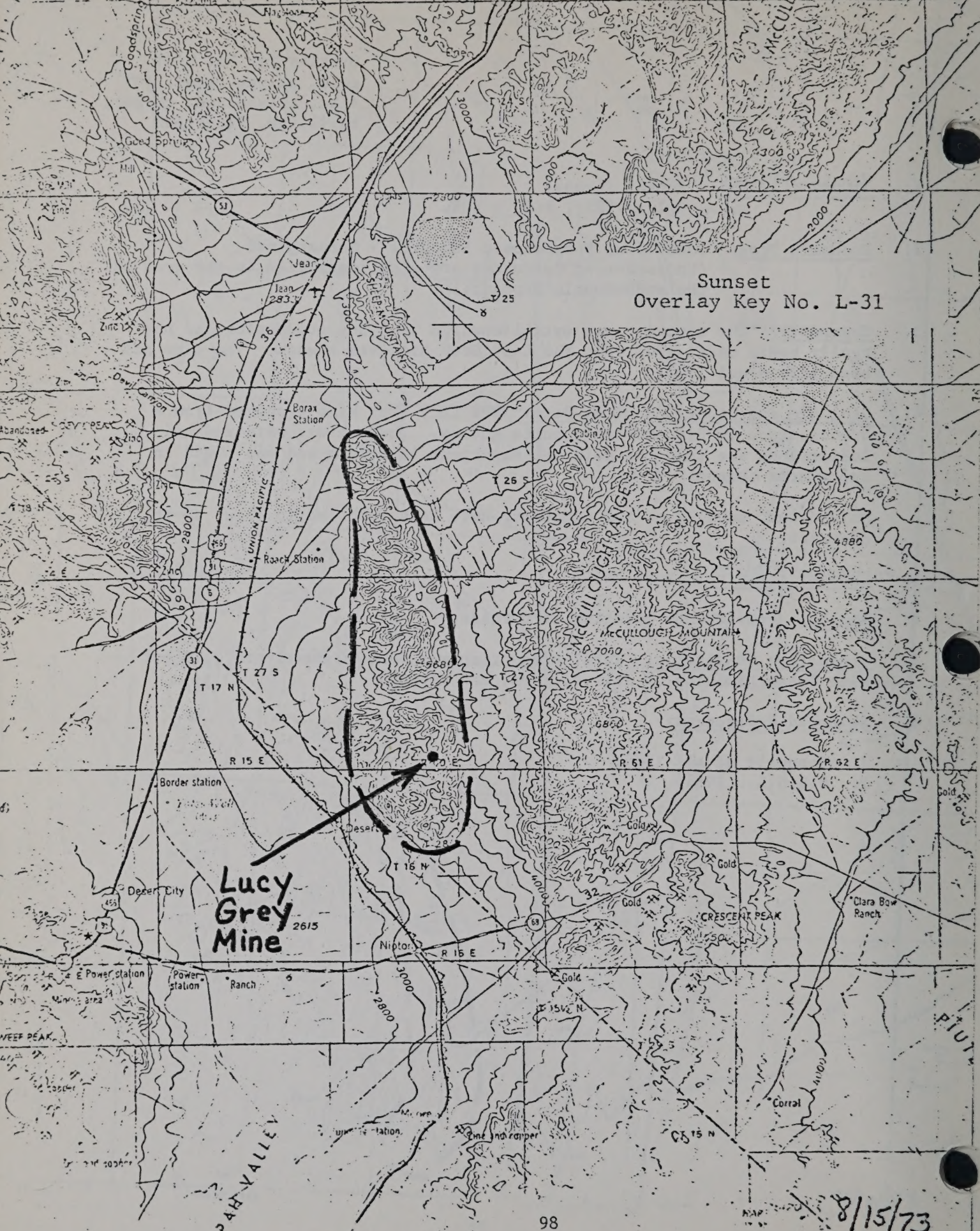
1. Mineral Area: Sunset (Lyons)
T.26 - 28S., R.59 - 60E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the area of the subeconomic deposit.)
3. Commodity: The district was established in 1897 but production did not really begin until 1905 when the Lucy Grey Mine was opened. The mine has been idle since 1941.
4. Geologic and Other Technical Data: The Lucy Grey Mine produced from a breccia zone in Precambrian granite gneiss. The ore was oxidized and indications are that the gold was supergene in origin and was found in the quartz cement.

Molybdenum, beryllium, and fluorspar have been reported to occur in the district.

5. Current Activity: None known.
6. Access: Provided by existing dirt roads.
7. Production Statistics: Total production was \$50,000 mostly in gold but with lesser amounts of silver, lead, and copper.
8. Selected References:
 1. Longwell et al. 1965.
 2. U.S.G.S.. 1964.

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Sunset
Overlay Key No. L-31



8/15/73

1. Mineral Area: Las Vegas - Three Kids
T.21 - 22S., R.63 - 64E.
2. Economic Type: Identified Subeconomic Reserve - Submarginal
(undiscovered resources are also identified in the area
of the subeconomic deposit.)
3. Commodity: The Three Kids Mine is the only mine that has successfully
exploited the manganese deposits in the Lake Mead Area. This mine was
opened in 1917 and was intermittently active until 1942. In 1942,
mining was moved to the "A", "B", and Hydropits to the west of the
Three Kids site.

In 1952 Manganese Inc., began mining the properties for the G.S.A. stock-
pile program. The contract expired in 1961 and the mines have been idle
since, although some ore concentrate is stockpiled at the site.

4. Geologic and Other Technical Data: The ore is a manganiferous sand-
stone interbedded with siltstones of the Muddy Creek Formation. At
the Three Kids site, these sediments are part of an open syncline that
that strikes northeast and which is cut off by the northwest trending
Lowney Fault and the Extension Fault. The early ores contained 40% Mn,
1½% Fe, and 15% silica. Ores mined later contained 15 - 20% Mn.
5. Current Activity: None at present time
6. Access: State Route 41, east of Henderson, provides paved access to
the area. No new access is required.
7. Production Statistics: The Three Kids produced over 600,000 long tons
of ore concentrate during its most productive period. The "A", "B",
and Hydro pits produced an additional 65,000 tons of concentrate.
8. Selected References:

Longwell et al. 1965.

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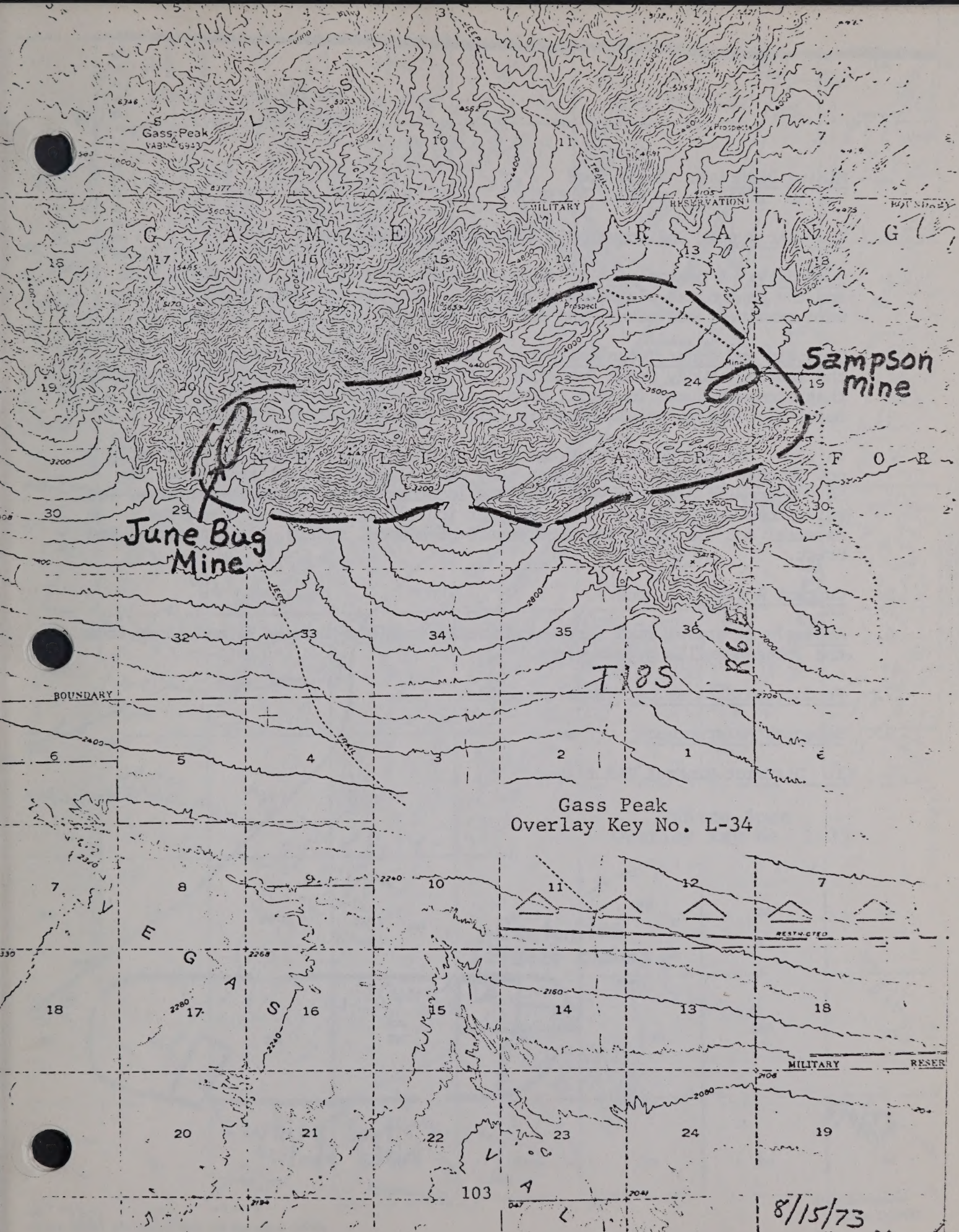
1. Mineral Area: Dike
T.19S., R.63E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the
area of the subeconomic deposit.)
3. Commodity: The only mine in the district is the Lead King Mine and
it was opened in 1916. Minor amounts of ore were reported to have been
shipped from the property. The mine has been inactive since that shipment.
4. Geologic and Other Technical Data: The mine explored a shear zone in
limestone of Carboniferous age. Galena with some cerussite was found at
the 26 and 135 foot levels. No ore was found below 135 feet. The ore-
bearing shear zone was 1 - 4 feet thick and had a strike of N.80 $\frac{1}{2}$ W, and
a dip of 60 $\frac{1}{2}$ N.
5. Current Activity: Minor prospecting and rock hounding.
6. Access: Existing unimproved road from U.S. Highway 93.
7. Production Statistics: Two carloads of ore were shipped from the Lead
King Mine in about 1917. No other quantification is available.
8. Selected References:
Longwell et al. 1965.

1. Mineral Area: Gass Peak
T.18S., R.61 - 62E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Undiscovered resources are also identified in the area of
the subeconomic deposit.)
3. Commodity: Production from the district has been small and mostly
from the June Bug Mine during 1916 and 1917. The only other mine
in the area is the Sampson Mine which has no recorded production.
4. Geologic and Other Technical Data: The ore occurs in a brecciated
zone of the dolomitic member of the Monte Cristo Limestone. Hydro-
zincite is the most common mineral. Calamine, malachite, chrysocolla,
and small amounts of gold and silver also occur in the ore.
5. Current Activity: The district never amounted to much and will
probably never do so. Current activity is nil. The district is now
within the Desert Wildlife Range (DWR) and Nellis Air Force Range
which takes it totally inaccessible. The Desert Wildlife Range has
been recommended to Congress as a wilderness area.
6. Access: Provided by a jeep trail across the DWR.
7. Production Statistics:

<u>Commodity</u>	<u>Amount</u>
Gold	9 $\frac{1}{4}$ oz
Silver	2418 oz
Lead	16,707 lbs
Zinc	<u>620,650 lbs</u>
Total Value:	\$ 82,637 (1917\$)

8. Selected References:
Longwell et al. 1965.

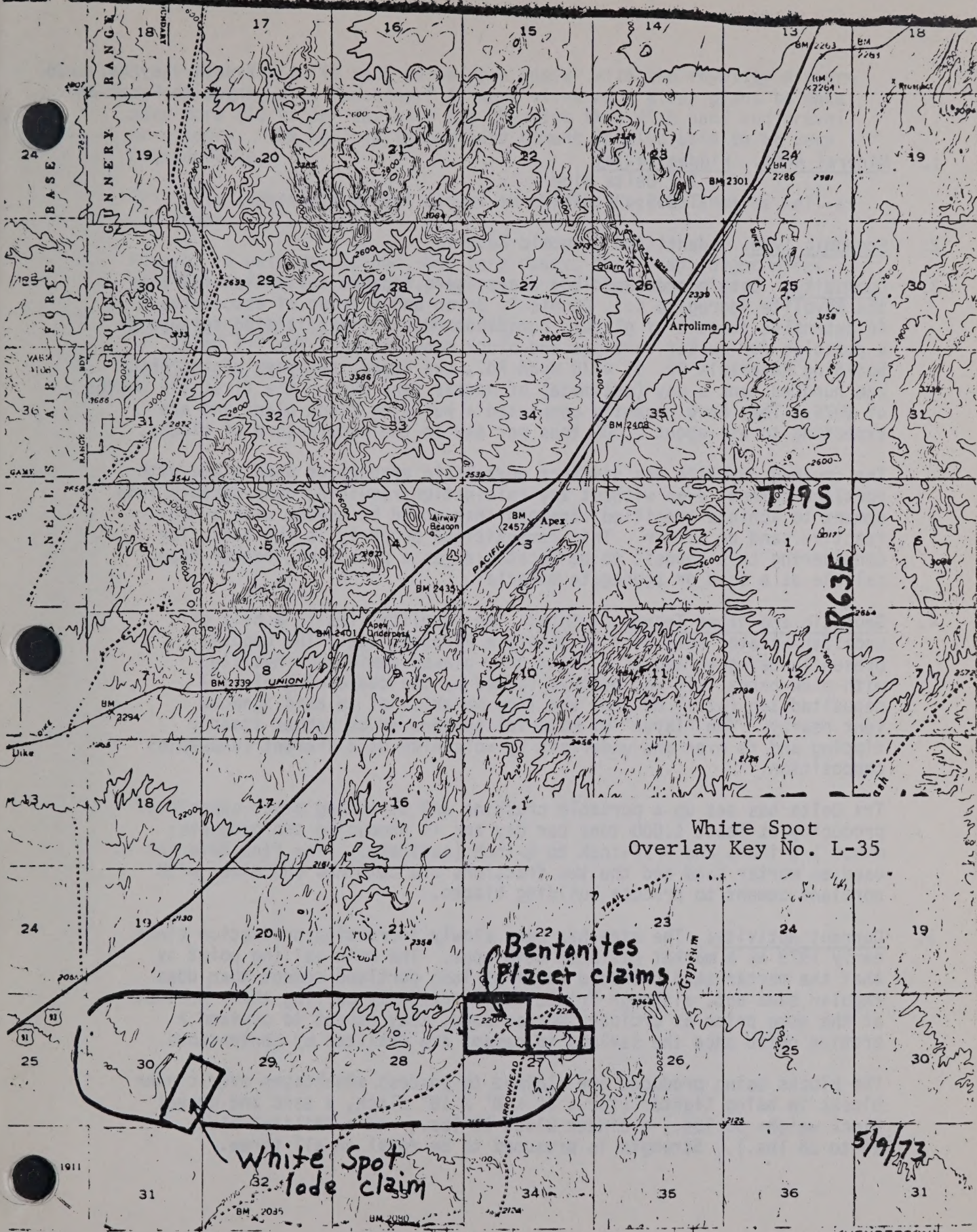
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1. Mining District: White Spot
T.19S., R.63E.
2. Economic Type: Undiscovered - Hypothetical Resources
3. Commodity: A bentonite clay deposit exists in this area. The White Spot and the Bentonites claims were originally located for this material. They were examined, contested, and declared null and void in the mid-1950's.
4. Geologic and Other Technical Data: The bentonite is apparently within the Tertiary Muddy Creek Formation. It is reported to be a gypsiferous clay that cannot be used for drill muds, ceramics, or reservoir linings. The results of the material tested is filed in the Mineral T&R files.

In 1956, the Las Vegas Brick and Tile Manufacturing Company, an apparently now defunct company, stated that they were planning to buy an average of 50,000 tcns of clay per year from the locators of the Bentonites claims, for which they were willing to pay 30¢ per ton. They planned to blend the material and use it in the manufacture of common, ruffle, and commercial red brick.

5. Current Activity: None.
6. Access: By gravel road (Arrowhead Trail) from old Highway 91 and 93 or from the Johns-Manville gypsum plant.
7. Production Statistics: None available.
8. Selected References:
 1. District Mineral T&R files.



White Spot
Overlay Key No. L-35

Bentonites
Flacet claims

White Spot
lode claim

5/9/73

1. Mineral Area: Hidden Valley
Tri Delta Mine
T.25S., R.61E.
2. Economic Type: Identified Economic Reserve
3. Commodity: Both placer and lode claims were located in 1975 and 1976 by the Rhyolite Aggregate Co., Dennis P. Bryan and a group of associates. An extensive deposit of glassy, pumiceous rhyolite was located for use as a pozzolan for mortar sand use and block manufacture. The Tri Delta Building Materials Co. of 4675 Wynn Rd., Las Vegas, has been mining about one hundred tons a day (estimate) of mortar sand during the first six months of 1979. They have recently completed a building block plant and are expecting to use about 1,000 tons per day in the manufacture of blocks.

The crushed rhyolite has distinct pozzolanic properties when mixed with portland cement, even without any calcination requiring considerably less cement to achieve specified strength than would be needed with a non-reactive sand or cinder. This cementitious property is the basis for considering this deposit to be locatable (as a pozzolan), rather than salable as a sand or aggregate material.

4. Geologic and Other Technical Data: The rhyolite lies in a belt of undifferentiated volcanics of possible Pliocene age. The deposit presently being worked is a light gray glassy pumiceous rhyolite with pink bands. It was perhaps formed by the coalescing of air-deposited ash (still molten) and flow material of an acid igneous vent nearby. The "layer" of material appears to be rather steeply dipping and is over and underlain by volcanics of different (unusable) composition.

Tri Delta has set up a portable crushing and screening plant capable of producing at least 1,000 tons per day and is producing two products: minus 1/8-inch, and 3/16-inch to 1/2-inch (estimate). The fine material is used as mortar sand and the two fractions are combined and mixed with portland cement to produce building blocks.

5. Current Activity: The mine has been slowly increasing production since early 1979 as a market has been developed. The main selling point is that the mortar sand produced requires less portland cement than does regular sand and, although Tri Delta is presently selling their product at the same price as ordinary mortar sand, they expect to command a premium price once the savings in cement are realized by contractors.

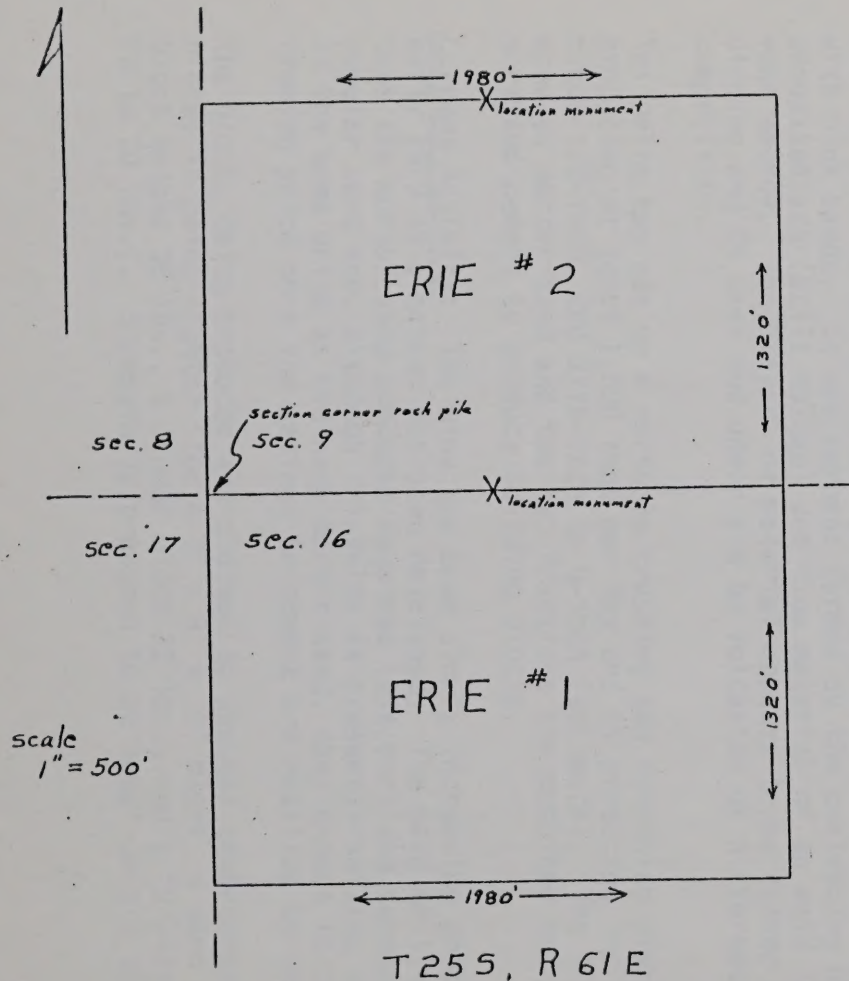
The blocks being produced are claimed to possess advantages over cinder blocks in being lighter (for a 8" x 8" x 16" block, a sand and gravel block weighs 38 lbs., a cinder block 32 lbs., and a "Rilite" block 26 to 28 lbs.). Strength is presumed to be equal on all three.

Block fabrication is said to be much easier with the rhyolity mixture as the wet mass is "smoother" to work allowing a given plant to make many more blocks per day with the rhyolite than with sand and gravel or cinders. The savings in portland cement is also said to be very considerable.

Tri Delta expects to market blocks in the Los Angeles area as well as Las Vegas.

6. Access: A well-maintained, but very dusty, dirt road, eight miles Long Leads from the old L.A. Highway to the operating mine.
7. Production Statistics: See Commodity.
8. Selected References: None.

Tr. c
orth



MAP OF THE ERIE NO. 1 & 2 PLACER CLAIMS

Clark County, Nevada

Each claim is 60 acres and conforms to legal subdivision

The Erie #1 is located in the NW 1/4 of NW 1/4 and W 1/2
of NE 1/4 of NW 1/4 of sec. 16, T25S, R61E, MDM

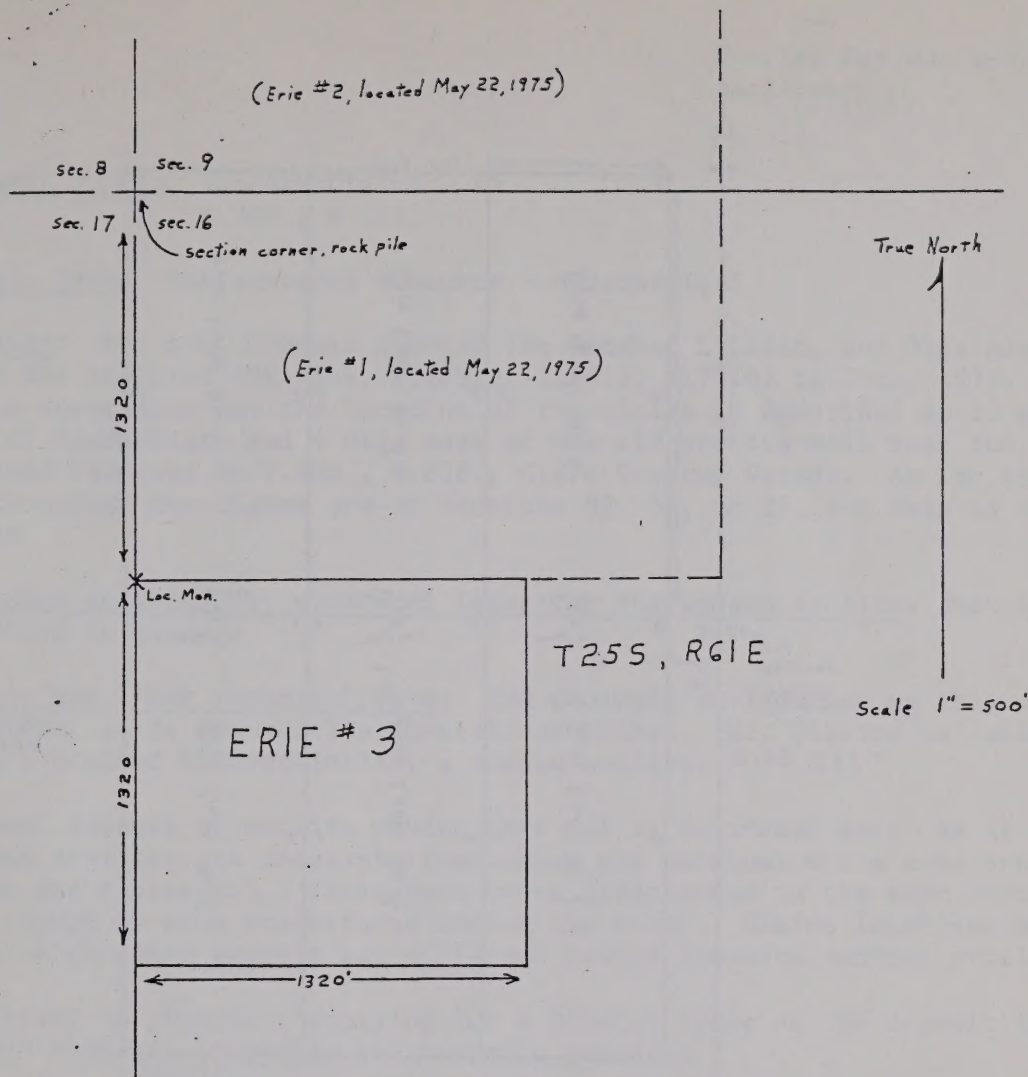
The Erie #2 is located in the SW 1/4 of SW 1/4 and W 1/2
of SE 1/4 of SW 1/4 of sec. 9, T25S, R61E, MDM

Located the 22nd of May 1975 by: (owners)

Dennis P. Bryan
1151 Buena Vista Ave.
Reno, Nevada 89503

Bruno Benna
P.O. Box 5665
Reno, Nevada 89503

Ingvar Christensen
P.O. Box 5665
Reno, Nevada 89503



MAP OF THE ERIE NO. 3 PLACER CLAIM Clark County, Nevada

The Erie #3 is 40 acres in area and conforms to legal subdivision and is located in the SW $\frac{1}{4}$ of NW $\frac{1}{4}$ of sec. 16, T25S, R61E, MDM

Located the 7th of January, 1976 by: (owners)

Dennis P. Bryan
1151 Buena Vista Ave.
Reno, Nevada 89503

Bruno Benna
P.O. Box 5665
Reno, Nevada 89503

Ingvert Christensen
P.O. Box 5665
Reno, Nevada 89503

APR 15 1981

1. Mineral Area: Gibford Claims
T.30S., R.63E.
2. Economic Type: Undiscovered Resource - Hypothetical
3. Commodity: Mr. L.P. Gibford located the Sandra, Lillian, and Olga mining claims for zeolites (Bk. 148, #117912, 117913, 117916) in June, 1972. The area is unsurveyed and the location of the claims is described as 12 miles south of Searchlight and $\frac{1}{4}$ mile east of the old perlite mill near the abandoned railroad in T.30S., R.63E., Clark County, Nevada. As far as can be determined, the claims are in Sections 33, 34, or 35, but this is not certain.

He is also applying for a mineral lease for the sodium zeolites that he is interested in mining.

4. Geologic and Other Technical Data: The geologic environment of this deposit is unknown, as is the zeolite mineral assemblage. Mr. Gibford is interested in the contained clinoptilolite, a sodium zeolite.

The legal aspects of zeolite mining have yet to be ironed out. As it stands now some zeolites are locatable (magnesium and calcium) while some are leaseable (sodium and potassium). Since both types often occur in the same deposit, it is difficult to mine one without mining the other. Claims locations and mineral leases on the same deposit but different people presents another problem.

Mr. Gibford is presently applying for a mineral lease on the deposit in order to cover both the locatable and leaseable zeolites.

5. Current Activity: None known.
6. Access: Provided by existing dirt roads.
7. Production Statistics: None known.
8. Selected References:

1. Longwell et al. 1965.
2. U.S.G.S. 1964.
3. Papke, K.G.. 1972.

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Gibford Claims
Overlay Key No. L-37

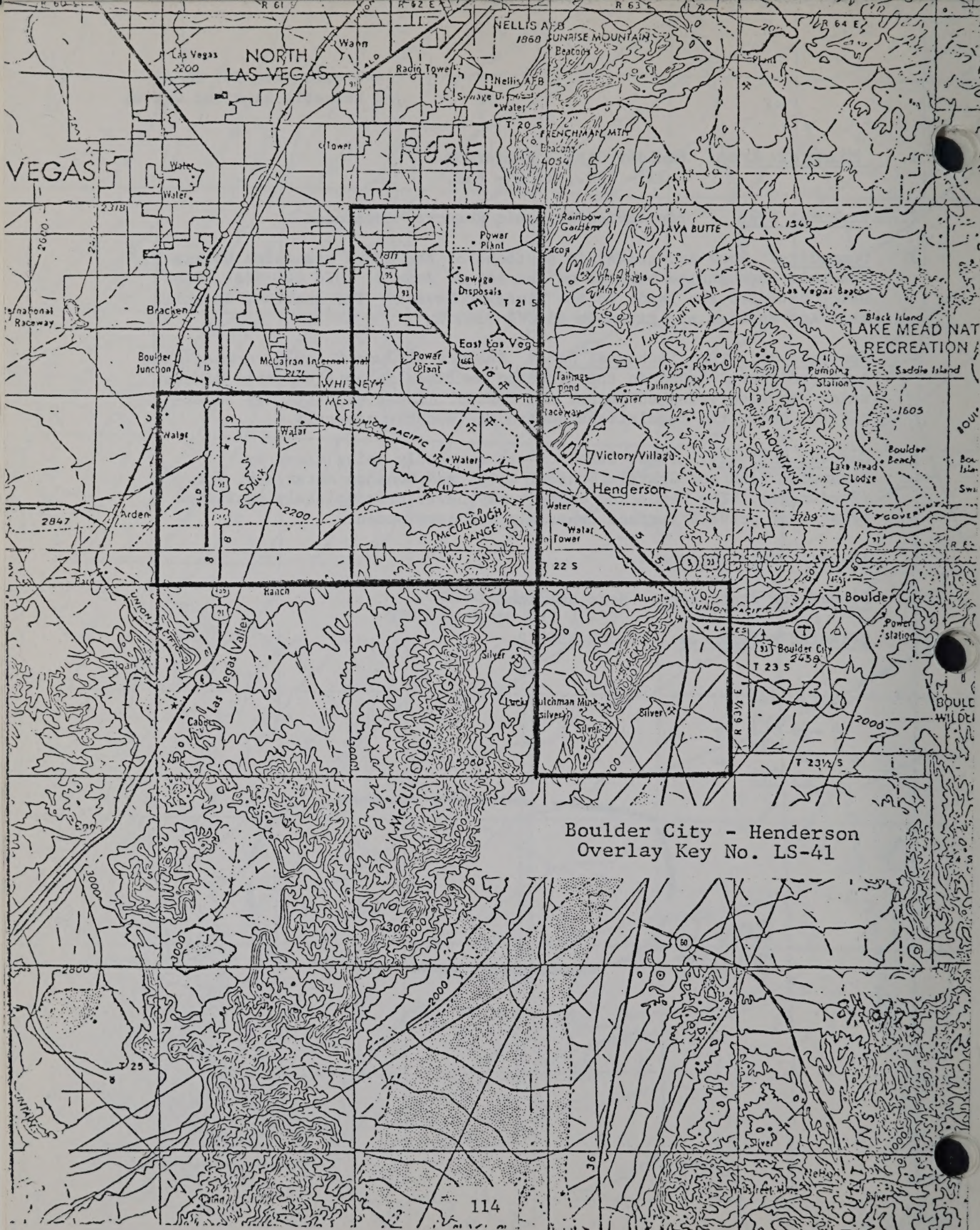
R63E
R64E

T30S
T31S

7/3/78

APR 15 1981

1. Mineral Area: Boulder City - Henderson
T.21 - 23S., R.61 - 63E.
2. Economic Type: Identified Economic Reserve - Measured
3. Commodity: Sand and gravel in portions of the above townships became leasable through the passage of the Act of June 8, 1926 (44 Stat. 708) which patented the lands to the State of Nevada. The sections in which this Act applies are given in 43 CFR 3563.2.
4. Geologic and Other Technical Data: The Act of June 8, 1926, deemed the sand and gravel found in the affected sections to be a valuable mineral which was reserved when patent was issued. These deposits may be exploited under the regulations governing leasable minerals.
5. Current Activity: These deposits are currently being mined by Gornowich Sand and Gravel (Boulder City) and Bonanza Materials, Inc. (Henderson). The Henderson deposit may never be completely exploited because of private surface ownership and development.
6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References: 43 CFR 3563.2



Boulder City - Henderson
Overlay Key No. LS-41

1. Mineral Area: East McCullough
T.21 - 23S., R.61 - 66E.
2. Economic Type: Identified Subeconomic Resource - Paramarginal
3. Commodity: East McCullough is an informal name given to the extensive sand and gravel deposits that lie in the Eldorado and Piute Valleys.

A complete inventory of these resources has never been made. Such an inventory would entail extensive exploration to delineate the deposits and to determine their quantity, quality, impurities, etc. Such an inventory will probably never be made because of the time and expense involved. Areas or deposits will in all probability be explored and tested as needed.

Potential reserves are of vast proportions because any alluvial fan or valley-fill can be expected to contain some useable material. Most of these reserves have had little or no exploration work done on them and will probably not be needed for many years to come if at all.

Part of the sand and gravel southwest of Boulder City is leasable under a special act of Congress (see the Boulder City District writeup, overlay key number LS-41).

4. Geologic and Other Technical Data: The sand and gravel deposits in the area were formed by the erosion and deposition of materials from the nearby mountains. The mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province. Erosion of the mountains and deposition of the materials in the down-faulted valleys has been the major geologic activity in the area since that time.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foothills as alluvial fans. Finer materials are transported further into the valleys and the valley centers are generally covered by silts and clays.

Since the mountains flanking the area are composed of two major rock provinces, the sand and gravel also exhibits different characteristics. The northern part of the area from Boulder City to the Nelson area has sand and gravel with a volcanic rock composition which was derived from the Tertiary volcanic rocks that make up the flanking mountains. From Nelson to Searchlight a mixed rock type composed of Tertiary volcanics and Precambrian schists, gneisses, and other metamorphic rock types can be found. Again, this reflects the predominant rock types of the mountains. From Searchlight to Fort Mojave the rock type is largely Precambrian metamorphics.

Some caliche has probably formed in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes.

5. Current Activity: Total reserves in the area are enormous but the quality is largely unknown. Much of these reserves can be presumed to be at least partially unuseable. The low areas of the valleys which are filled with silts and clays will be unuseable except perhaps as a soil or soil conditioner. Caliche and other impurities will make other deposits unuseable.

Several areas can be expected to be used in the future. These areas are to the south and southwest of Boulder City, along U.S. Highway 95, around the towns of Searchlight and Nelson, and in the Fort Mojave area.

Boulder City Area - The Boulder City area can be expected to expand as the populations of the Las Vegas Valley grows. It is already something of a "bedroom" community for Las Vegas and will grow as more people begin commuting. As it expands, demand for sand and gravel will increase and ultimately the area to the south and southeast of the city will be exploited. The alluvial fans between Boulder City and Nelson appear to be of good quality and should supply all of the demand if no conflicts over such use arise. As noted previously, much of this area is under the leasing laws (see the Boulder City District writeup) and the surface has been patented to the State of Nevada. Much of this deposit may therefore be unavailable for exploitation.

Searchlight - The alluvial fans that fill the northern end of Piute Valley to the west of Searchlight should be able to supply all of the demands made by a growing bedroom community at Searchlight.

U.S. Highway 95 - Road construction and repair along Highway 95 will probably use existing pits for some time. Construction of a new road to accommodate increased traffic will require sites within a mile or two of the road. Deposits along the road should be ample for such uses.

Fort Mojave Area - The State Engineer (1971) has projected a population of 50,000 in the area by the year 2020. Deposits in this area appear to be adequate to meet these demands if no other uses are in conflict.

6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References:
1. Longwell et al. 1965.
 2. Hess 1971.

APR 15 1981

1. Mineral Area: Los Angeles Freeway
T.19 - 28S., R.58 - 62E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
(Identified Economic Reserve - North Jean Lake
Community Pit)
3. Commodity: Los Angeles Freeway is an informal name given to the sand and gravel deposits in portions of the Las Vegas Valley and the northern extension of the Ivanpah Valley into Nevada, through which the freeway passes.

A complete inventory of the sand and gravel resources of the area has never been made. Such an inventory would entail extensive exploration using backhoes, core drills, and so on to delineate the deposits, and determine their quantity, quality, impurities, etc. Such an inventory will probably never be made because of the time and expense involved. Areas or deposits will in all probability be explored and tested as needed.

Potential reserves of vast proportions exist in the area because any alluvial fan or valley-fill can be expected to contain some useable sand and gravel. Most of these potential reserves have had little or no exploration work done on them, and most will probably not be needed for many years if at all.

4. Geologic and Other Technical Data: The sand and gravel in the area were formed by the erosion and deposition of materials from the nearby mountains. These mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province. Erosion of the mountains and deposition of these materials in the down-faulted valleys has been the major geologic activity area since that time.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foothills as alluvial fans. Finer materials are transported further into the valleys and the valley centers are generally covered by fine silts and clays. Since the source rocks of the area vary in type and composition, the sand and gravel also varies in its composition. The northwestern portion (between I-15, Blue Diamond Road, and Mountain Pass) is covered by deposits composed predominantly of limestone gravels derived from the mountains to the west and south. This is also true of the Goodsprings Valley which is surrounded by limestone and mountains. In the main portion of the valley, from Arden to the Jean area, a mixture of limestone and volcanic rocks are found in the gravel. The volcanic rocks are derived from the northern McCullough Mountains to the east. From Jean south to the California border a mixture of limestone and Precambrian metamorphic rock types occur along with lesser amounts of volcanic rock types. The Precambrian metamorphics are derived from the southern McCullough Mountains and the Lucy Grey Range.

Caliche has probably formed in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes.

5. Current Activity and Potential Development: Total reserves in the valley are enormous but the quality is largely unknown. Much of these reserves can be presumed to be at least partially useable. The low areas of the valley which are filled with silts and clays will be unuseable except perhaps as top soil base or soil conditioner. Caliche and other impurities will make other deposits unuseable.

Four areas can be expected to be exploited within the next 15+ years. These are the areas south of the Blue Diamond Road, the Sloan area, the Goodsprings-Jean area, and along I-15.

South of Blue Diamond Road - This area can be expected to receive increased attention as a source of sand and gravel as closer deposits are depleted and/or Las Vegas grows southward. The sand and gravel deposits are probably at least partially useable.

Sloan Area - This area will receive increased attention as a source of sand and gravel as Las Vegas grows southward.

Goodsprings-Jean area - If this area becomes a bedroom community for Las Vegas, large demands for sand and gravel can be expected during the housing and road construction phase. Useable sand and gravel occurs in the Goodspring Valley and the alluvial fan upon which Jean is located. These deposits should meet all requirements if the area's population does not grow much above 5,000 to 10,000.

I-15 - The freeway has been completed in this area and existing material sites should be adequate for road repair needs. Widening of the road to accommodate increase traffic will require much more gravel, but reserves appear adequate for these needs too.

6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References:

1. Longwell et al. 1965.
2. Hess 1971.

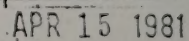
APR 15 1981

1. Mineral Area: Las Vegas Dunes
T.19S., R.63E.
2. Economic Type: Identified Subeconomic Resource - Paramarginal
(Undiscovered resources are also identified in the area
of the subeconomic deposit.)
3. Commodity: Blow sand or dune sand is commonly used in the Las Vegas area
for a top soil or top soil base. Requests for small lot mineral material
sales of such materials were received by the District at the rate of several
a month. The dunes area has been withdrawn for recreation purposes.

The blow sand in the Las Vegas Dunes area is the largest deposit of such
material within easy driving of Las Vegas.

4. Geologic and Other Technical Data: The dune sand found in this area is a
recent eolian deposit whose parent material is the Tertiary Muddy Creek
Formation. The deposit is fairly extensive and in places up to 5 feet to
6 feet deep. It is composed almost entirely of quartz sand. Some silt
and a little gravel also occurs in the deposit.
5. Current Activity: None except for occasional trespass.
6. Access: From Apex off-ramp on Interstate 15, along old Highway 91 and 93.
7. Production Statistics: None available.
8. Selected References: None.

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1. Mineral Area: East Sunrise
T.20S., R.63E.
2. Economic Type: Identified Economic Reserve--Indicated
Subeconomic and undiscovered resources are also
identified in the area of the economic deposit.)
3. Commodity: East Sunrise is an informal designation for a widespread
alluvial deposit of red sands, silts, and clays. This deposit lies
to the east of the Sunrise Mountains along Lake Mead Boulevard and
Gypsum Plant Road.

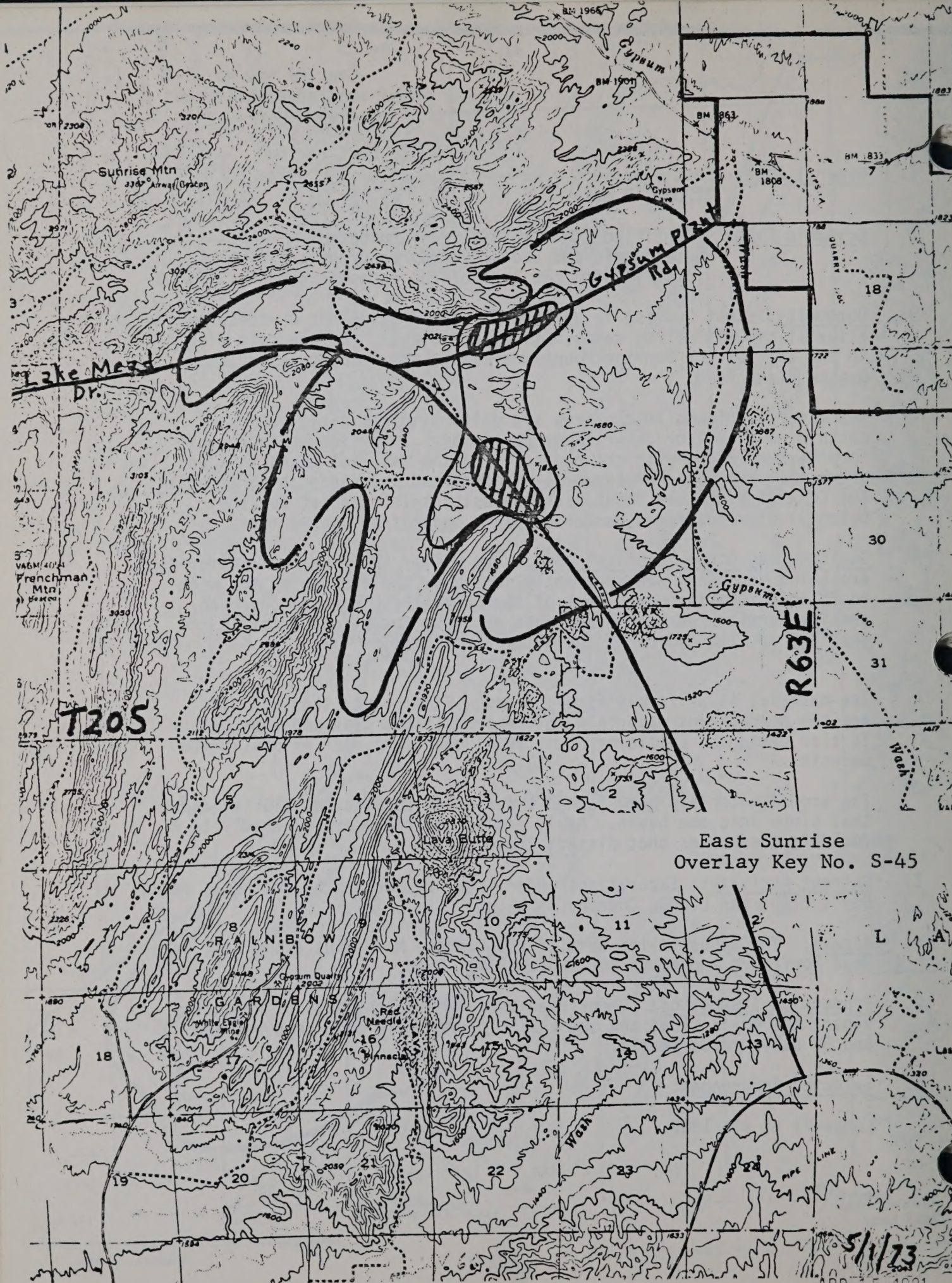
The materials found in the area are uniform in grain-size etc. and contain no gravel or other large particles. This fine-grained, uniform texture along with the red color of the material makes this an attractive material for baseball diamond sand and landscaping material. The City of North Las Vegas has been using this material for their baseball diamonds for a number of years under free use permits.

4. Geologic and Other Technical Data: The valley in which these materials
are being deposited was apparently formed by the erosion of the weak
rocks that form the upper part of the Callville Limestone (Permian)
and the Permian red beds. Remnants of these formations exist in the
area and are the source of the alluvial materials.

The material is uniformly fine-grained. Fine quartz sand and silt are the predominant materials in the deposit but clay and some gypsum is also present. Little or no material over sand size exists in the deposit.

The eroded materials have formed a series of coalescing alluvial fans that slope into the basin. Newly eroded materials are generally to be found in the washes that dissect these fans.

5. Current Activity: Excavations under Free Use Permits by North Las Vegas,
Boy's Club, and L.D.S. Church.
6. Access: The deposit lies east of the Sunrise Mountains along East Lake
Mead Boulevard and along the Gypsum Plant Road.
7. Production Statistics: Under Free Use Permits, the City of North Las
Vegas, the Boy's Club, and the L.D.S. Church have each used between 20
and 50 cubic yards yearly.
8. Selected References:
Longwell et al. 1965.



East Sunrise
Overlay Key No. S-45

5/1/73
APR 15 1981

1. Mineral Area: Sunrise Mountains
T.19 - 22S., R.61 - 63E.
2. Economic Type: Identified Economic Reserve--Measured
(Subeconomic resources are also identified in the area
of economic deposit.)
3. Commodity: Sunrise Mountain is an informal name designating the extensive sand and gravel deposits located on the western flank of the Sunrise Mountains. This deposit is part of the "Salt Lake Freeway" sand and gravel deposits but because of the intensive interest in and exploitation of these deposits it is easier to discuss them separately.

This area is presently being used as a source of construction materials for the Las Vegas-Henderson area and includes areas that have been granted mineral patents for sand and gravel or have patent applications pending. A majority of the patent applications have been rejected and claims ruled null and void since they were located on oil and gas leases. Trespass action has been initiated against the claimants.

The Sunrise Mountain Natural Area to the east of these deposits has been closed to mineral location and leasing but remains open to material sales and free use. This was apparently done to provide a nearby source of sand and gravel for road construction and repair in the Natural Area.

4. Geologic and Other Technical Data: The area is part of a series of coalescing alluvial fans formed by the deposition of materials eroded from the Sunrise Mountains to the east. These mountains are a tilted fault-block of predominantly Paleozoic limestones. Precambrian schists and gneisses occur below these limestones but are not well exposed. Younger sandstones occur above the limestones at the south end of the range.

These mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province. Erosion of the mountains and deposition of these materials in the down-faulted valleys has been the major geologic activity in the area since that time.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foothills as alluvial fans. Finer materials are transported further into the valleys and the valley centers are generally covered by fine silts and clays.

Caliche has formed in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes. In other areas (see map) gibbsite, a low grade gysiferous soil, may make the deposit unuseable if it is deep or extensive.

The gravel is composed largely of grey to black, round to subround, limestone and dolomite clasts with minor amounts of red sandstone, chert, and metamorphic rock types.

5. Current Activity: Within this area are one long term contract, three community pits, and one highway right-of-way materials site. Numerous companies are active in the community pits.

While potential reserves are large, available supplies are small. Most of the deposits are in private hands and are being used for subdivisions, trailer courts, etc. which make the sand and gravel inaccessible.

Very little is left under BLM jurisdiction and much of that has been applied for. Much of what is left of the sand and gravel under BLM jurisdiction has been set aside as highway material sites or is under material sale application.

Many of the companies now active in the area are on private lands obtained through mineral patents, state selections, townsite patents, or are on mining claims with pending patent applications.

Encroaching subdivisions will make mining incompatible in the area within 5-10 years. This encroachment will affect not only BLM but the private operators as well. Pits now in existence will be forced to close and new supplies of materials from outside of the area will have to be found. This will have to be done by buying or leasing from private owners especially near Henderson. Depletion of materials will hasten the closing of some pits. Depletion and encroachment will, as noted, force the companies into other areas probably on private land but also possibly on BLM lands in other parts of the valley.

6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References:
1. District Mineral T&R files.
 2. Longwell et al. 1965.
 3. Hess. 1971.

1. Mineral Area: Tonopah Highway
T.16 - 22S., R.53 - 62E.
2. Economic Type: Identified Economic Reserve and Subeconomic Resources
(Inferred)
3. Commodity: Tonopah Highway is an informal name given to the extensive sand and gravel deposits located in the Las Vegas Valley along the Tonopah Highway.

A complete inventory of these resources has never been made. Such an inventory would entail extensive exploration to delineate the deposits and to determine their quantity, quality, impurities, etc. Such an inventory will probably never be made because of the time and expense involved. Areas or deposits will in all probability be explored and tested as needed.

Potential reserves are of vast proportions because any alluvial fan or valley-fill can be expected to contain some useable material. Most of these reserves have had little or no exploration work done on them and most will probably not be needed for many years to come if at all. However, several areas can be expected to be exploited in the near future.

4. Geologic and Other Technical Data: The sand and gravel deposits in the area were formed by the erosion and deposition of materials from the nearby mountains. The mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province.

Erosion of the mountains and deposition of the materials in the down-faulted valleys has been the major geologic activity in the area since that time. The Las Vegas Valley, through which the Tonopah highway runs, is an inactive strike-slip fault system, possibly related to the San Andreas fault system.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foot-hills as alluvial fans. Finer materials are transported further into the valleys and the valley centers are generally covered by silts and clays. Since most of the mountains flanking the valley are composed of limestone and other carbonate rocks, the sand and gravel also contains high percentages of these rock types. Some sandstone and other rock types occur but they are minor constituents.

Caliche has probably formed in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes. The lower parts of the valley have extensive deposits of silts and clays which are also unuseable except perhaps as top soil base or soil conditioners.

5. Current Activity: Total reserves in the area are enormous but the quality is largely unknown. Much of these reserves can be presumed to be at least partially unuseable.

However, several areas can be expected to be exploited in the near future. These areas are the Kyle Canyon area, West Las Vegas, and the Tule Springs area, along with other deposits to the north and east of the highway.

Development is going on at a rapid rate in the West Las Vegas area at the present time and the sand and gravel situation has become critical. Mineral trespass is a constant problem in the area. Because of the current heavy activity, the West Las Vegas District has been described in a separate writeup.

The Lone Mountain, Tule Springs, and Kyle Canyon areas are also becoming critical at a rapid rate. The situation is not as bad as in the West Las Vegas area but will be in the next few years. Mineral trespass is a growing problem in these areas.

Kyle Canyon - (Subeconomic-Paramarginal) This is one of very few sand and gravel areas noted in the original mineral inventory of the area. Demand for the material can be expected to increase in the next 1-5 years for road construction material and in 5-10 years for road and home construction materials as small tracts in the area are built up. The deposit in the canyon itself will not supply this demand since a great deal of the sand and gravel is already under private owned and developed small tracts. The area between Kyle Canyon and Tonopah Highway as well as the deposits flanking the southwest side of the highway will have to be used extensively.

Lone Mountain - (Economic Reserve) There are good deposits near Lone Mountain and in the canyons to the west. Much of it has been classified for small tract disposal and is unavailable. The canyon deposits are partly under contested mining claim locations and the Solicitor has advised that no disposal action be taken pending a decision on the appeal. The claims are the Charleston groups and are located in Sections 34-36, T.19S., R.59E., and Sections 3 and 4, T.20S., R.59E.

The Lone Mountain area is being rapidly built up and every day potential sand and gravel resources are being covered by houses. The growth will accelerate in the next few years, and demands for nearby sand and gravel will climb. The available deposits will not be able to supply the demand and materials will have to be hauled in at higher costs.

Tule Springs Area and the Northeast Side of the Highway - (Subeconomic-Paramarginal) The situation here is nearly identical to that described for the Lone Mountain area. New subdivisions and other developments are increasing the demands for sand and gravel at the same time that they cover large acreages of potential reserves.

In addition to this, large areas contain no suitable sand and gravel but are instead covered by silts and clays that are unuseable. Other areas are classified for small tract disposal which makes the deposits unavailable but which will require sand and gravel as houses and roads are constructed in the area.

6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References:
 1. District Mineral T&R files.
 2. Longwell et al. 1965.
 3. Hess. 1971.

1. Mineral Area: West Las Vegas
T.20 - 22S., R.59 - 61E.
2. Economic Type: Identified Subeconomic Resource - Paramarginal
3. Commodity: West Las Vegas is the area that is being built up most rapidly and consequently sand and gravel is in high demand. A number of the largest sand and gravel companies have pits in the area, and large tracts of land have been patented for sand and gravel. The Arden Community pit is also located in this area.

A complete inventory of these resources has never been made. Such an inventory would entail extensive exploration to delineate the deposits and to determine their quality, impurities, etc. Such an inventory will probably never be made because of the time and expense involved. Areas or deposits will in all probability be explored and tested as needed.

4. Geologic and Other Technical Data: The sand and gravel deposits in the area were formed by the erosion and deposition of materials from the nearby mountains. The mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province. Erosion of the mountains and deposition of the materials in the down-faulted valleys has been the major geologic activity in the area since that time. Las Vegas Valley is an inactive strike-slip fault system, possibly related to the San Andreas fault system.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foothills as alluvial fans. Finer materials are transported further into the valleys and valley centers are generally covered by silts and clays.

Since most of the mountains flanking the valley are composed of limestone and other carbonate rocks, the sand and gravel also contains high percentages of these rock types. Some sandstone and other rock types occur but they are minor constituents.

Caliche has probably formed in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes. The lower parts of the valley have extensive deposits of silts and clays which are also useable except perhaps as top soil base or soil conditioners.

Total reserves in the area are enormous but little is still available. Most of the area is in private hands either through extensive small-tracting or through mineral patents. The area is being built up at a rapid rate and demands for sand and gravel are high. More sand and gravel is needed than is being supplied and mineral trespass as well as long hauls from other areas are commonplace occurrences.

The large acreage that has been patented for sand and gravel has been largely untouched, and could supply much needed sand and gravel if exploited. Land prices are skyrocketing in the area, however, and the patentees apparently prefer to hold onto much of the land for speculation rather than to mine the gravel. This is not true of all of the claims, however. Wells Cargo, W.M.K., Stocks, and Arrow, all have operating pits and are churning out sand and gravel as fast as they can. Depletion of the deposits at their pit sites and housing encroachment will force them to move to other areas in the next 5-10 years.

In summary, there is plenty of sand and gravel in the area but little is still available for exploitation. Housing and small tracts have covered large tracts of the area, making the sand and gravel unavailable.

Sand and gravel in private ownership could supply most of the demands if it was fully exploited. This does not appear to be a likely occurrence because the land is worth more for housing than for sand and gravel.

Those companies that are producing will be faced with depletion and encroaching housing in the near future and will eventually be forced to close down.

The Highway Department will need large quantities of sand and gravel for new road work but few if any areas are still available to them.

5. Current Activity: Several companies are active in the area.

6. Access: Existing Roads.

7. Production Statistics: None available.

8. Selected References:

1. District Mineral T&R files.
2. Longwell et al. 1965.
3. Hess. 1971.

1. Mineral Area: Pahrump Valley
T.26S., R.58E.
2. Economic Type: Identified Subeconomic Resource - Submarginal
3. Commodity: A complete inventory of the sand and gravel resources of this district has never been made. Such an inventory would entail extensive exploration using backhoes, core drills, and so on to delineate the deposits, and determine their quantity, quality, impurities, etc. Such an inventory will probably never be made because of the time and expense involved. Areas or deposits will in all probability be explored and tested as needed.

Potential reserves of vast proportions exist in the Pahrump Valley because any alluvial fan or valley-fill can be expected to contain some useable sand and gravel. Most of these potential reserves have had little or no exploration work done on them, and most will probably not be needed for many years if at all. The mineral status overlay shows the existing material sites and free use areas and one can expect additional needs in the future.

An area for a long-term possibility exists along the Blue Diamond-Pahrump Road to the west of Mountain Springs. This area could conceivably be exploited as a sand and gravel source for Las Vegas if and when the closer-in deposits are depleted or over run.

4. Geologic and Other Technical Data: The sand and gravel deposits in the Pahrump Valley were formed by the erosion and deposition of materials from the nearby mountains. These mountains and valleys were formed during the Cenozoic period and are part of the Basin and Range Province. Erosion of the mountains and deposits of these materials in the down-faulted valleys has been the major geologic activity in the area since that time.

The character of the sand and gravel is determined largely by the parent material and the distance from the source to the area of deposition. The larger and heavier clasts are generally deposited along the mountain foothills as alluvial fans. Finer materials are transported further into the valleys and the valley centers are generally covered by fine silts and clays. Since the source of the Pahrump Valley deposits are the Spring Mountains which are largely limestones and dolomites, the sand and gravel is rich in these carbonate rocks, with only small amounts of sandstone and other rock types.

Caliche has probably been forming in these materials since their original deposition. This caliche will make the affected deposits unuseable for many purposes.

5. Current Activity: Total reserves in the valleys are enormous but the quality is largely unknown. Much of these reserves can be presumed to be at least partially unuseable. The low areas of the valley which are filled with silts and clays will be unuseable except perhaps as top soil base or soil conditioner. Caliche and other impurities will make other deposits unuseable.

Highway construction and repair will make use of existing sites until these are depleted or new construction is planned. Sand and gravel is available within short-haul distances of the road and should meet all future demands.

As previously indicated, the area west of Mountain Springs is the most likely to be exploited in the future. However, the haul distance, steep grades over Potosi Pass, and the winding narrow road make such exploitation a "last resort" situation.

6. Access: Existing roads.
7. Production Statistics: None available.
8. Selected References:
 1. Longwell et al. 1965.
 2. Cornwall. 1972.

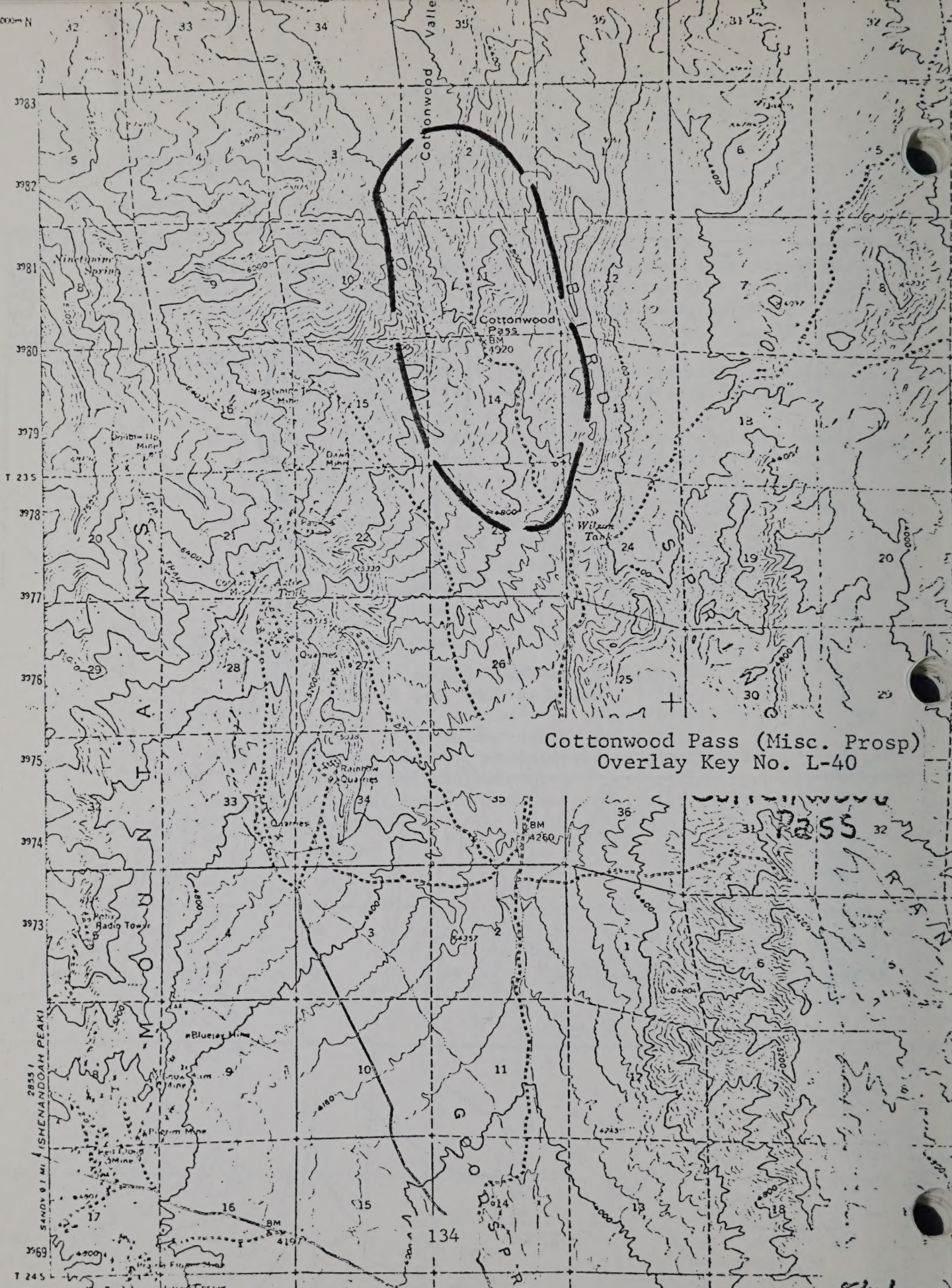
1. Mineral Areas: Miscellaneous Prospects
2. Economic Type: Undiscovered Resources
3. Commodity: The following prospects are areas in which mineralization and favorable geology indicates that some potential may exist. There is very little information available concerning these prospects so that the value of this potential is unknown.

a. Hypothetical Resources

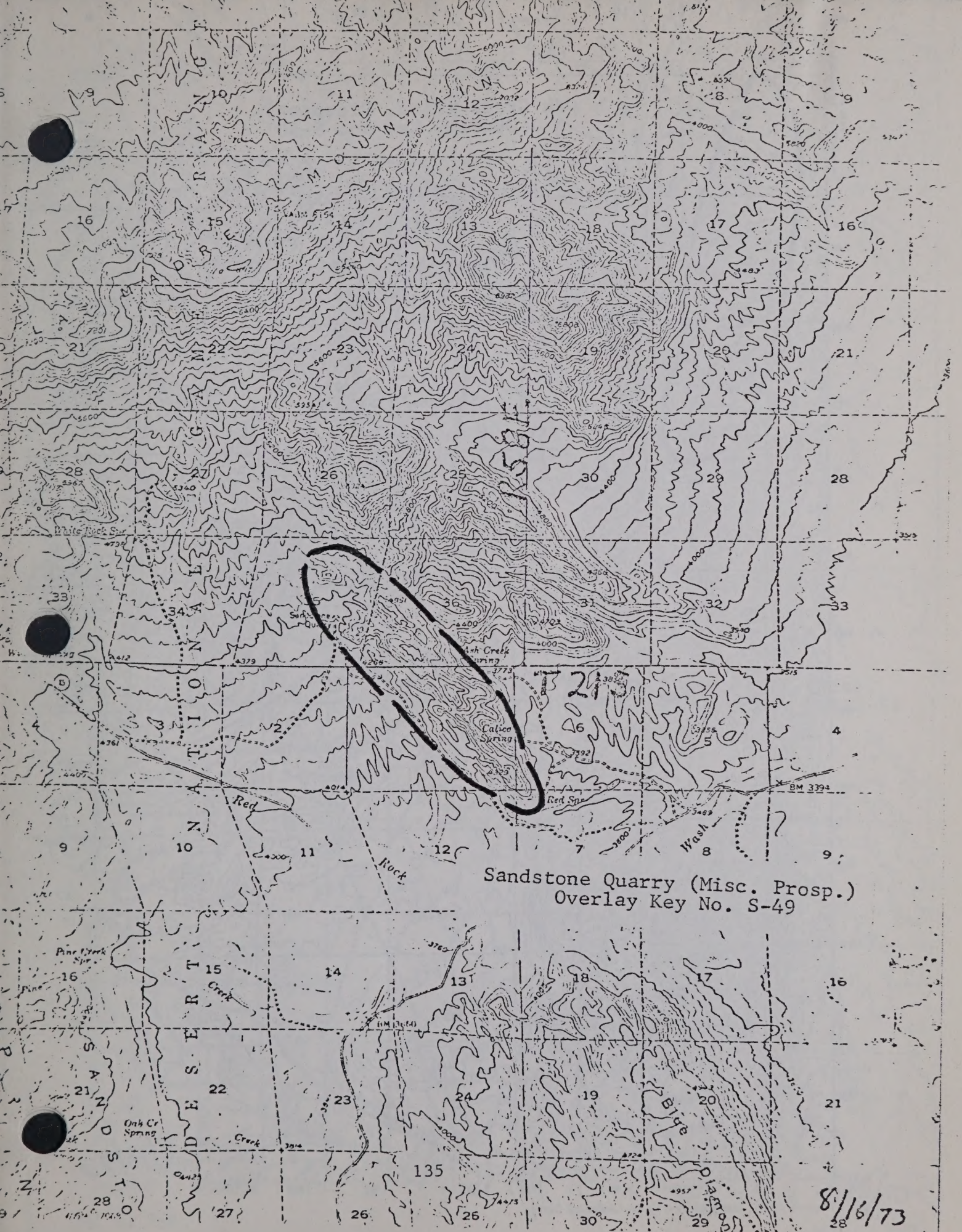
- L-40: (Cottonwood Pass), T.23S., R.58E., Carnatite occurs as fracture coatings in Permian sandstone associated with manganese oxide, calcite and celestite.
- S-51: (Aztec Tank-Red Bluff), T.23S., R.58E., Fourteen small quarries for flagstone exist on a small hill of Permian red beds. Total production from this areas has been small.
- S-52: (Nevada Royale), T.22 & 23S., R.59 & 60E., USGS Goodsprings Quadrangle (1960) shows numerous quarries present in the area. The rocks are the Kaibab, Toroweap, Coconino, and Permian red sandstones. Production is unknown.

b. Speculative Resources

- L-38: (Jean Silica), report of mining claims for eolian silica sand in Sec. 12, 13, and 24, T.18S., R.59E.
- L-39: (Red Rock Wash), included in the inventory as potentially valuable for silver and lead.
- S-49: (Sandstone Quarry), inventoried as potentially valuable for building stone.
- S-50: (Oak Creek), inventoried as potentially valuable for building stone.



Cottonwood Pass (Misc. Prosp)
Overlay Key No. L-40

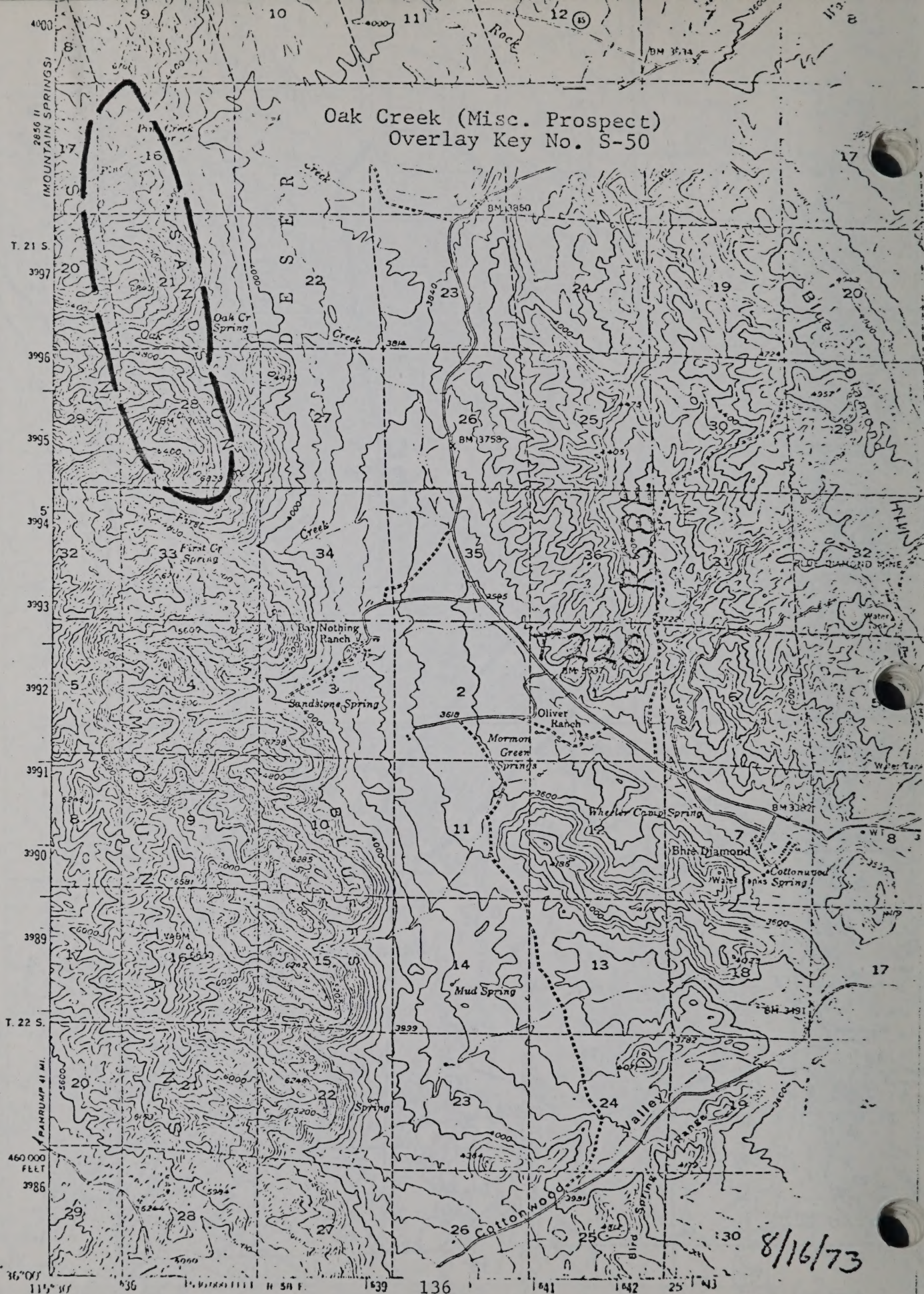


Sandstone Quarry (Misc. Prosp.)
Overlay Key No. S-49

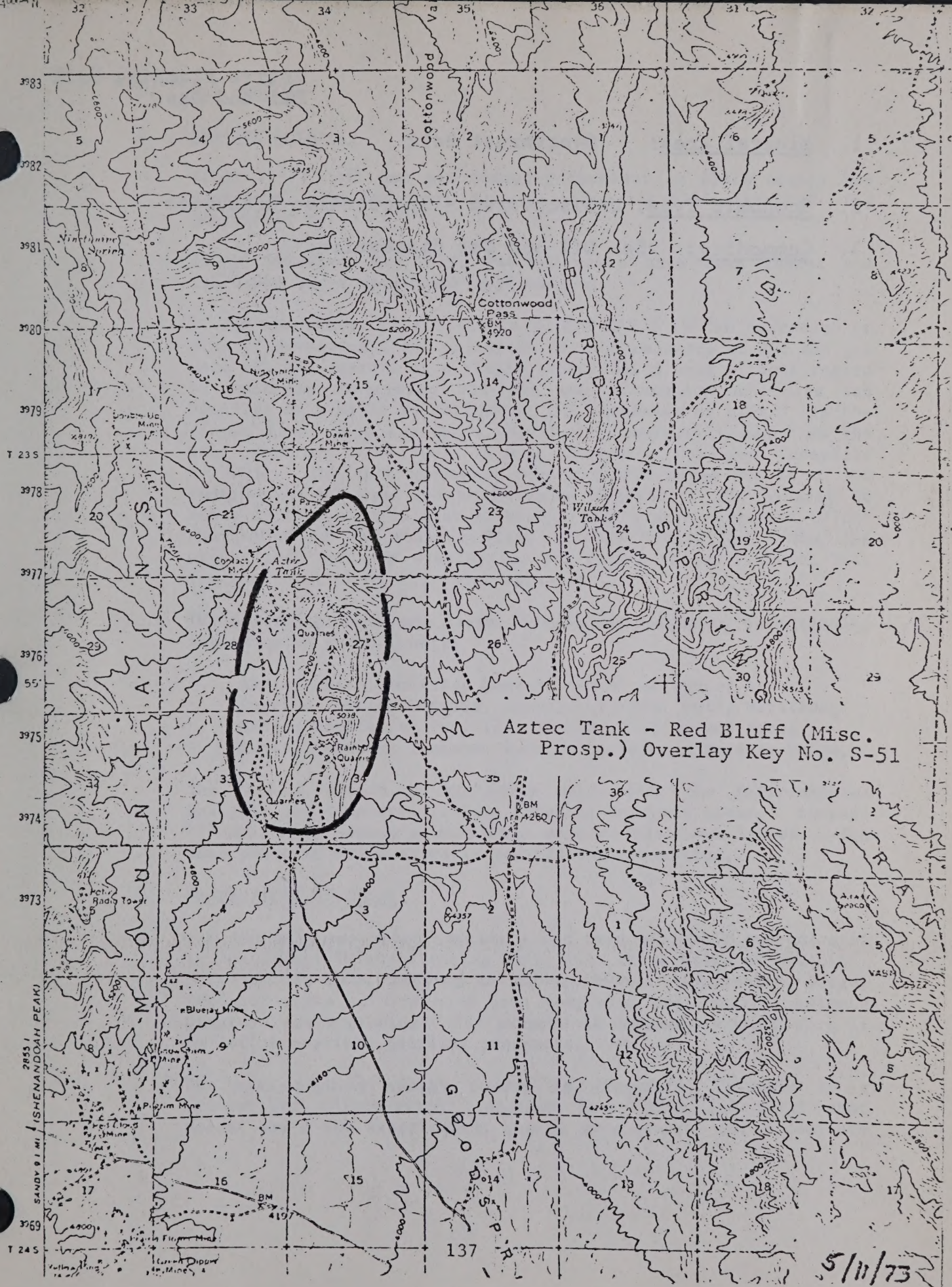
8/16/73

APR 15 1981

Oak Creek (Misc. Prospect)
Overlay Key No. S-50



8/16/73



Aztec Tank - Red Bluff (Misc. Prosp.) Overlay Key No. S-51

5/11/73

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1. Mineral Area: Overthrust Belt
2. Economic Type: Undiscovered - Speculative Resources
3. Commodity: See Oil and Gas discussion.

D. Oil and Gas

1. Leasing Activity

Since FY-77, oil and gas industry interest in Clark County has increased significantly due to the identification of the Overthrust Belt.

As of December 30, 1979, 944,640 acres have been leased and 1,175,040 acres were under application.

A unit agreement, as defined in 30 CFR 226.2 is "an agreement or plan of development and operation for the recovery of oil and gas made subject thereto as a single consolidated unit without regard to separate ownerships and for the allocation of costs and benefits on a basis as defined in the agreement or plan." In the Virgin River Unit Agreement, Mobil Oil Company is named as the unit operator with 100% of the interests utilized (casefile N-27505). The unit agreement covers 23,205 acres and is to 500 feet below the top of the Devonian Formation. The benefit to Mobil in this case is that acreage within a unit agreement is not chargeable to the maximum State acreage limitation. See the Geophysical Activity Overlay for the Virgin Valley Planning Unit for the location of this unit agreement.

The following major and large independent companies have leasing interests in Clark County:

Amerada Hess; American Quasar; Amoco; Anschutz; Arco; Chevron; Cities Service; Emerald; Forest; Gulf; Marathon; Mobil; Pendleton; Phillips; Placid; Reading and Bates; Sohio; Sunmark; Tennaco; Texaco; Tucker and Snyder; Union.

The leasing crunch is virtually over, once the Environmental Analyses are completed for the "Special Resource Areas," because 77% of Clark County's available acreage has been leased. The next phase of exploration is geophysical evaluation.

2. Geophysical Activity

For the past two years, activity has been basically concentrated in the Virgin Valley Planning Unit, with crews based at Mesquite. Activity has been trending to the southwest. Apparently, large, regional scale surveys have been completed and detailed seismic programs are beginning. The purpose of detailed seismic work is to define possible drilling prospects.

The most popular energy source is vibroseis, followed by a primer-cord (ditch-witch), shallow (less than 100 feet) shot holes, and a new experimental charge on a stick. For a complete

description of these methods, see Appendix 1 of the Environmental Analysis on Oil and Gas Leasing in the RRCRL (USDI 1980).

Although geophysical exploration is allowed on an oil and gas lease, if companies wish to conduct geophysical exploration operations without a lease, a permit is required. Prior to initiating operations a "notice of intent to conduct oil and gas exploration" (NOI) must be filed with the BLM district manager. A \$5,000 bond is also required. Upon completion of exploration, a "notice of completion of oil and gas exaploration" is also filed and the district manager has 90 days to notify the permittee as to whether or not the conditions of the permit have been met (Maley 1977).

The following geophysical companies have been active in Clark County:

CG&G; Engineering Specialties, Inc; Exploration Survey; Geophysical Services Company; Mile-High Corporation; Pacific West Company; Photogravity, Inc.; Seisdata Services, Inc.; Seismograph Services Corporation; Western Geophysical, Inc.

To date, February 1981, activity has increased twofold since FY-78. Table .42-1 summarizes the Notice of Intent (NOI) filings for fiscal years 1977 to 1980. No NOIs were received in FY-76.

TABLE .42-1
Clark County

NOTICES OF INTENT TO CONDUCT OIL AND GAS EXPLORATION

	FY	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981*</u>
Stateline		0	0	3	0	8	4
Virgin Valley		0	3	11	4	12	9
Totals		0	3	14	4	20	13

* October, 1980 through February, 1981 only.

Approximately 2,000 line miles of exploration were shot in fiscal years 1979 and 1980, 1,500 of which were in the Virgin Valley Planning Unit and 500 in the Stateline Planning Unit. According to industry contacts, activity will increase again over current levels by FY-81, to approximately 15 crews in the field at one time. The Geophysical Activity Overlays show the location of known geophysical exploration lines.

3. Drilling Activity

See Figure .42-2 for the locations of all known wells drilled in Clark County. Table .42-3, keys known data to this map. Mobil Oil Company recently completed drilling the Virgin River No. 1-A USA wildcat within the Virgin River Unit. The location is: 654 feet north and 1,544 feet east of the southwest corner, Sec. 9 T.15S., R.68E. Ground level is 1,905 feet ASL. The drill rig was the Brinkerhoff Signal #53, and the spud date was September 23, 1979. According to industry sources, the drilling rate was higher than expected, 10 feet/hour rather than the expected 2-4 feet/hour. This well is known as a "tight hole," that being one with no release of geologic data, however, no commercial oil or gas finds were reported. According to the API 1978 Drilling Cost Survey, the cost of a 20,000 foot wildcat in the Overthrust Belt is \$343/foot. At a total depth of 19,650 feet, Mobil's well represents an investment of almost \$7 million (1978 dollars).

Chevron Oil Company has indicated interest in drilling two 10,700 foot wildcats in the Muddy Mountains area. Wilderness conflicts exist in one well site. The Buffington location is 1,000 feet west and 1,500 feet south of the northeast corner of Sec. 14, T.18S., R.65E. The Muddy Mountains prospect is 13,000 feet west of the northeast corner of T.19S., R.65E., on the township line.

4. General Geology

The Overthrust Belt is a geologic concept that began 55 years ago in Canada. It has recently become productive in the United States and capable of trapping major oil and gas fields. The U.S. boom began in 1975, with the Pineview field, Utah, discovery.

The Overthrust Province is part of a vast system known as the Cordilleran Orogenic Belt. This complex of mountain ranges and basins extends all the way from Alaska to South America. Orogeny is a term meaning mountain-building period.

However, between southern Nevada and Chihuahua, Mexico, the belt is so obscured, that some geologists doubt its continuity. A recent study of the Nevada-to-Mexico interval provides evidence that the belt is continuous, without major interruptions. The complications are the result of pre- and post-orogenic events (Drewes 1978). Figures .42-4 through .42-7 illustrate current thinking on the approximate limits of the Belt.

From studies of ancient rocks, geologists theorize the Cordillera evolved from thick, primarily marine sediments, deposited in a deep oceanic trough along the western margin of a drifting North American Continent (Plate). This stack of sedimentary rocks, designated the Cordilleran Geosyncline, was formed from late Precambrian to Mesozoic time. In the Virgin Valley Planning

Unit, the thicknesses of these rocks are estimated at less than 8,000 feet. In Stateline, these thicknesses are estimated to be about 26,000 feet.

A marked change in the evolution of the Cordillera occurred in the Devonian period, with the Antler Orogeny. This western mountain-building phase deformed part of the geosynclinal deposits, thrusting them eastward over other portions of the geosyncline.

The Nevadan Orogeny, begun in the Triassic and extending into the Jurassic, extensively deformed rocks of the area by folding, faulting, and metamorphism. The eastward pulses had the greatest impact in the Stateline Planning Unit. Rocks deformed by this orogeny are best exemplified by the Sierra Nevadas.

Further east, the Sevier Orogeny began in late Jurassic time. Violent stresses compressed the sedimentary rocks, breaking them into massive sheets, exceeding 20 miles in width and several miles thick. The sheets were moved or thrust eastward over adjacent sections resulting in an effect similar to shingles on a roof. Great multiple slabs of intricately folded, possible oil-bearing strata were formed as sheets were transported eastward 50 to 70 miles. The Sevier Orogeny is thought by at least one geologist, to be a phase of the Laramide Orogeny, which formed the present structural configuration of the Basin and the Range Province.

At this point, it should be emphasized that because of the Sevier Orogeny, potential exploration targets are equally likely to be in the mountainous terrain or alluvial valleys (below the alluvial fill).

The eastern edge of the Overthrust Belt is sharply delineated by the appearance of thrust faults. There is no zone of gradually increasing folding east of the thrust faults. The western limits of the Belt are poorly known because regional tectonic studies west of the Spring Mountains have not been made. Some ranges to the west contain thrust faults and are overprinted by the Basin and Range structural configuration.

Some of the more important thrust faults in this area are the Keystone, Bird Spring, and Willow Tank in the Stateline Planning Unit, and the Muddy Mountain and Glendale in the Virgin Valley Planning Unit. Some of these are illustrated in Figure .42-8. At this time, it is unknown what the relationship between the faults and oil accumulations is.

Apparently, the entire Paleozoic and Triassic Formations are potential targets in the lower thrust plate. About 110 miles

northeast of Las Vegas, 7 miles northeast of Hurricane, Utah, in sections 13-15, T.41S., R.12E., SLB, is the Virgin field. This field produced small quantities of 22-32° oil from the Triassic Moenkopi formation. In Rainbow Gardens, about 20 miles southwest of the Muddy Mountains is reported "tarry oil residues" in the Moenkopi (Bissell 1969). In the Goodsprings mining district, asphaltic material (dead oil), is reported to occur (Kepper 1980).

In 1959, Shell Oil Company drilled a wildcat in the Bowl of Fire (Virgin Valley Planning Unit), about 6 miles south of the Muddy Mountains and reportedly had oil shows in the Triassic, Permian, and Mississippian strata (#62 of Figure .42-2). In 1972, Texaco drilled a well four miles west of Rox and reportedly had oil shows in the Moenkopi (#140 of Figure .42-2).

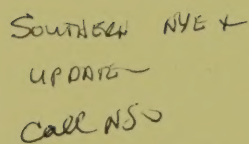
5. Potential for Development

The empirical characteristics that are used in a pre-discovery evaluation of an area are sediments, unconformities, regional arching, evidence of oil and gas, and permeability.

In Clark County, between 8,000 and 26,000 feet of sediments exist. The geosyncline is considered to be a geologic basin. Petroleum is equally likely to be found in both depositional and structural basins, and along the edges as well as near the centers. Reliable reports indicate the two wildcats by Texaco and Shell have had shows of oil. A show of oil is defined as "a trace of oil or gas detected in a core, cutting, or circulated drilling fluid, or geophysical logs run in a well." Two surface evidences have also been reported. Because of the uplifts involved with thrusting, unconformities exist. Arching occurs along folds and faults, and these also provided local trapping mechanisms. The only unanswered question is that of permeability. Only drilling can answer that.

Several companies in Clark County feel that this area is one of the most promising on shore drilling regions in the United States. The heavy leasing play and considerable monetary investment in geophysical research bears this out. To date, more than 12 fields have been discovered along the Overthrust. Geologists estimate that undiscovered resources of 15 billion barrels of oil and 100 trillion cubic feet of gas exist in the Overthrust Belt.

DRILLING ACTIVITY IN CLARK COUNTY



Source: Base Map modified from Garside and Schilling, 1977.

TABLE .42-3

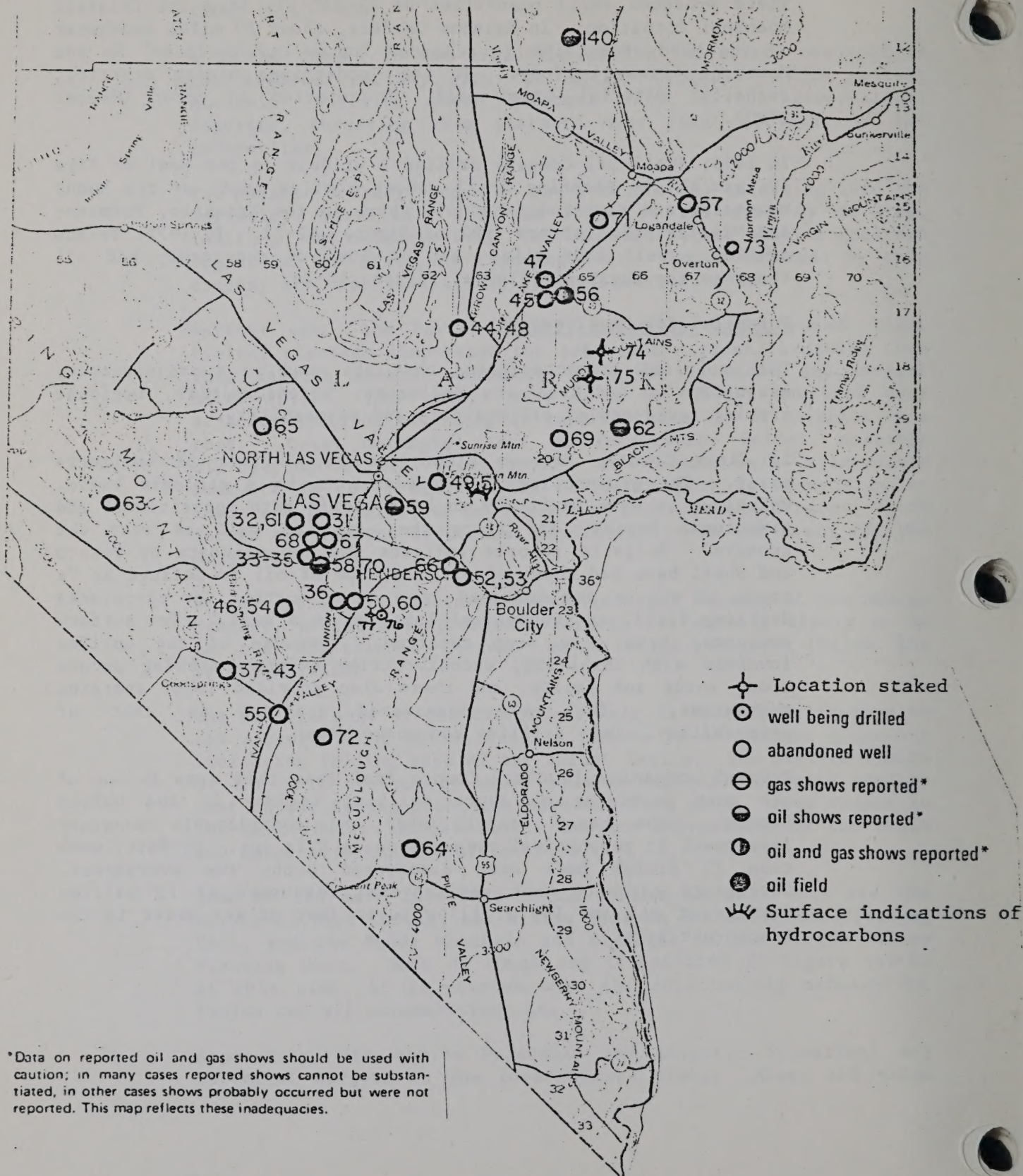
DRILLING ACTIVITY IN CLARK COUNTY
FROM 1929 TO 1980

Map Reference No.	Well Status*	Company	Well Name	Date	Total Depth
31	○	E.W. Bannister	No. 1	1929	522 ft
32	○	Commonwealth Oil Co.	No. 1	1933	1,897 ft
33	○	L.M. Hatfield	No. 1	1935	707 ft
34	○	Red Star Oil Co.	J.B. Nelson No. 1	1943	2,210 ft
35	○	Red Star Oil Co.	J.B. Nelson No. 2	1943	3,767 ft
36	○	Nevada Exploration Co.	Porter No. 1	1947	2,002 ft
37	○	New Haven Oil Co.	No. 1	1947	716 ft
38	○	New Haven Oil Co.	No. 2	1947	405 ft
39	○	New Haven Oil Co.	No. 3	1947	200 ft
40	○	New Haven Oil Co.	No. 4	1947	226 ft
41	○	New Haven Oil Co.	No. 5	1947	40 ft
42	○	Goodsprings Oil Co.	No. 1	1948(?)	370 ft
43	○	New Haven Oil Co.	No. 6	1948	130 ft
44	○	United Petroleum Corp.	Apex No. 1	1948	1,247 ft
45	○	G&G Exploration Co.	No. 1	1949	1,130 ft
46	○	Black and Gold Oil and Gas Exploration Co.	Golden Spike No. 1	1950	950 ft
47	○	Last Chance Oil Co.	Crystal No. 1	1950	1,002 ft
48	○	So. Nevada Oil Investors Co.	Apex No. 1	1950	1,455 ft
49	○	McAuley Associates	No. 1	1952	1,970 ft
50	○	Big Basin Oil Co.	Govt. No. 1	1953	2,000 ft (?)
51	○	McAuley Associates	No. 2	1953	3,000 ft
52	○	Leonard Wilson	Govt. No. 1	1953	810 ft
53	○	Leonard Wilson	Govt. No. 1A	1953	1,466 ft
54	○	Intermountain Associ- ates, Inc.	Arden Dome No. 1 (No. 1X)	1954	3,293 ft
55	○	Intermountain Associ- ates, Inc.	(Jean) No. 1	1954	2,273 ft
56	●	So. Great Basin Oil & Gas, Inc.	Govt. No. 1	1954	5,085 ft
		Redrilled as:			
		John A. Haeber	Adam No. 1	1973	3,496 ft
57	○	Moapa Nevada Oil & Gas Co.	Logandale No. 1	1955	575 ft
58	●	U.S. Oil Co. (Matador Oil Co.)	Wilson No. 1X	1955	2,020 ft
59	●	Joe W. Brown	Wilson Govt. No. 1	1956	8,508 ft
60	○	W.T. Smithdale Jr.	U.S. Lease No. 1	1956	300 ft
61	○	Bonanza Oil Co.	Arden Dome No. 1 (Consolidated Govt. No. 1)	1959 (?)	3,260 ft
		Redrilled as:			
		Time Petroleum, Inc.	Federal No. 31-1	1971	3,260 ft
62	●	Shell Oil Co.	Bowl of Fire Unit No. 1	1959	5,919 ft
63	○	Tri-State Oil Ex- ploration Co.	Miskell-Govt. No. 1	1959	2,602 ft
64	○	Oscar Bray	No. 1	1961 (?)	840 ft
65	○	C.J. Lichtenwalter & C.M. Turpin	Turpin No. 1	1961	777 ft

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FIGURE .42-2
Clark County

DRILLING ACTIVITY IN CLARK COUNTY



Source: Base Map modified from Garside and Schilling, 1977.

DRILLING ACTIVITY IN CLARK COUNTY
FROM 1929 TO 1980

Map Reference No.	Well Status*	Company	Well Name	Date	Total Depth
31	○	E.W. Bannister	No. 1	1929	522 ft
32	○	Commonwealth Oil Co.	No. 1	1933	1,897 ft
33	○	L.M. Hatfield	No. 1	1935	707 ft
34	○	Red Star Oil Co.	J.B. Nelson No. 1	1943	2,210 ft
35	○	Red Star Oil Co.	J.B. Nelson No. 2	1943	3,767 ft
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37	○	New Haven Oil Co.	No. 1	1947	716 ft
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42	○	Goodsprings Oil Co.	No. 1	1948(?)	370 ft
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44	○	United Petroleum Corp.	Apex No. 1	1948	1,247 ft
45	○	G&G Exploration Co.	No. 1	1949	1,130 ft
46	○	Black and Gold Oil and Gas Exploration Co.	Golden Spike No. 1	1950	950 ft
47	○	Last Chance Oil Co.	Crystal No. 1	1950	1,002 ft
48	○	So. Nevada Oil Investors Co.	Apex No. 1	1950	1,455 ft
49	○	McAuley Associates	No. 1	1952	1,970 ft
50	○	Big Basin Oil Co.	Govt. No. 1	1953	2,000 ft (?)
51	○	McAuley Associates	No. 2	1953	3,000 ft
52	○	Leonard Wilson	Govt. No. 1	1953	810 ft
53	○	Leonard Wilson	Govt. No. 1A	1953	1,466 ft
54	○	Intermountain Associ- ates, Inc.	Arden Dome No. 1 (No. 1X)	1954	3,293 ft
55	○	Intermountain Associ- ates, Inc.	(Jean) No. 1	1954	2,273 ft
56	●	So. Great Basin Oil & Gas, Inc. Redrilled as:	Govt. No. 1	1954	5,085 ft
		John A. Haeber	Adam No. 1	1973	3,496 ft
57	○	Moapa Nevada Oil & Gas Co.	Logandale No. 1	1955	575 ft
58	●	U.S. Oil Co. (Matador Oil Co.)	Wilson No. 1X	1955	2,020 ft
59	●	Joe W. Brown	Wilson Govt. No. 1	1956	8,508 ft
60	○	W.T. Smithdale Jr.	U.S. Lease No. 1	1956	300 ft
61	○	Bonanza Oil Co.	Arden Dome No. 1 (Consolidated Govt. No. 1)	1959 (?)	3,260 ft
		Redrilled as:			
		Time Petroleum, Inc.	Federal No. 31-1	1971	3,260 ft
62	●	Shell Oil Co.	Bowl of Fire Unit No. 1	1959	5,919 ft
63	○	Tri-State Oil Ex- ploration Co.	Miskell-Govt. No. 1	1959	2,602 ft
64	○	Oscar Bray	No. 1	1961 (?)	840 ft
65	○	C.J. Lichtenwalter & C.M. Turpin	Turpin No. 1	1961	777 ft

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TABLE .42-3 (continued)

DRILLING ACTIVITY IN CLARK COUNTY
FROM 1929 TO 1980

Map Reference No.	Well Status	Company	Well Name	Date	Total Depth
66	○	Trans-World Oil Co. (Leonard Wilson)	Houssels-Wilson- Milka No. 1	1962	2,300 ft
67	○	Equality Oil Co. (Arden Dome Oil Co.)	Chadek No. 1	1964	1,627 ft
68	○	Jack F. Grimm (Minerals Drilling, Inc.)	Wilson No. 1	1965	5,686 ft
69	○	Rosen Oil Co.	Muddy Dome (Federal) No. 1	1965	5,666 ft
70	●	Kamarden Oil & Gas Ltd.	KOG-1	1969	6,755 ft
71	○	C.P. Phelps	No. 1	1970	1,625 ft
72	○	Sandia International Metals Corp.	Duff No. 1	1971	438 ft
73	○	Mobil Oil Co.	Virgin River No. 1 USA	1979	19,562 ft
74	+	Chevron Oil Co.	Buffington Pockets Location	1980	
75	+	Chevron Oil Co.	Muddy Mountains Location	1980	
76	⊙	Fleetwood Oil & Gas Corp.	Eva Garten No. 1	1980	(2,800 ft)
77	+	Fleetwood Oil & Gas Corp.	Ger No. 1	1980	(2,800 ft)

Lincoln County (informational only):

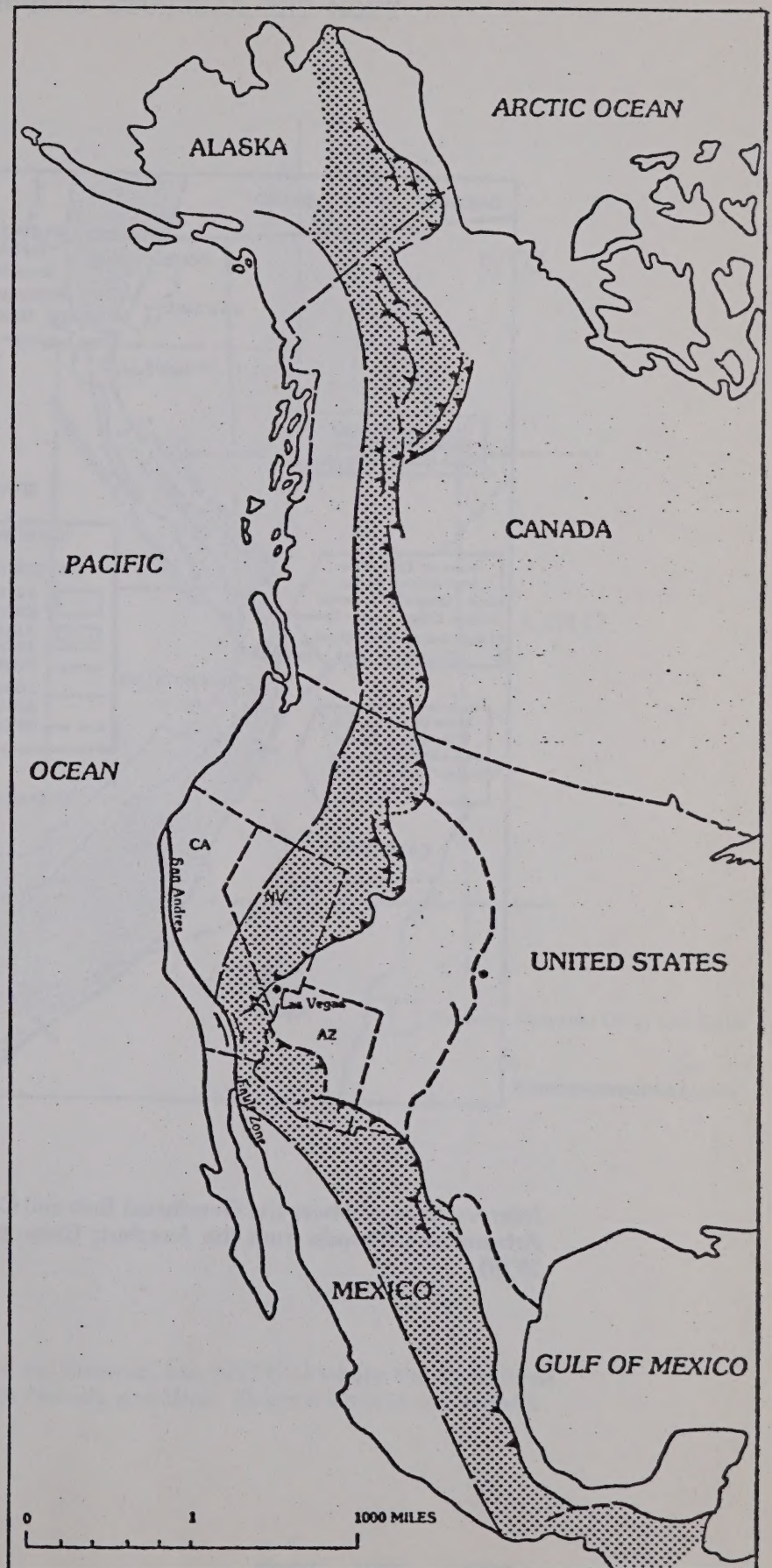
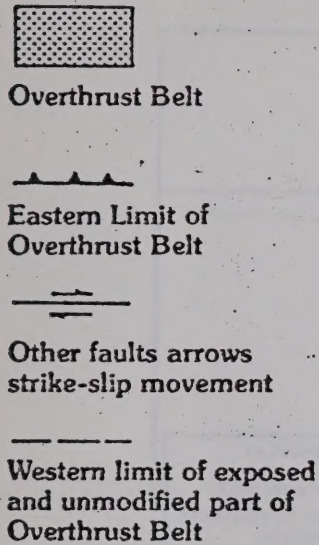
140	●	Texaco, Inc.	Federal No. 1	1972	7,030 ft
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- * ○ Abandoned Well
 ⊙ Well Being Drilled
 ● Oil Shows Reported
 ⊖ Oil and Gas Shows Reported
 + Location Staked

See Figure .42-2 for locations of the well sites in this table.

FIGURE .42-4

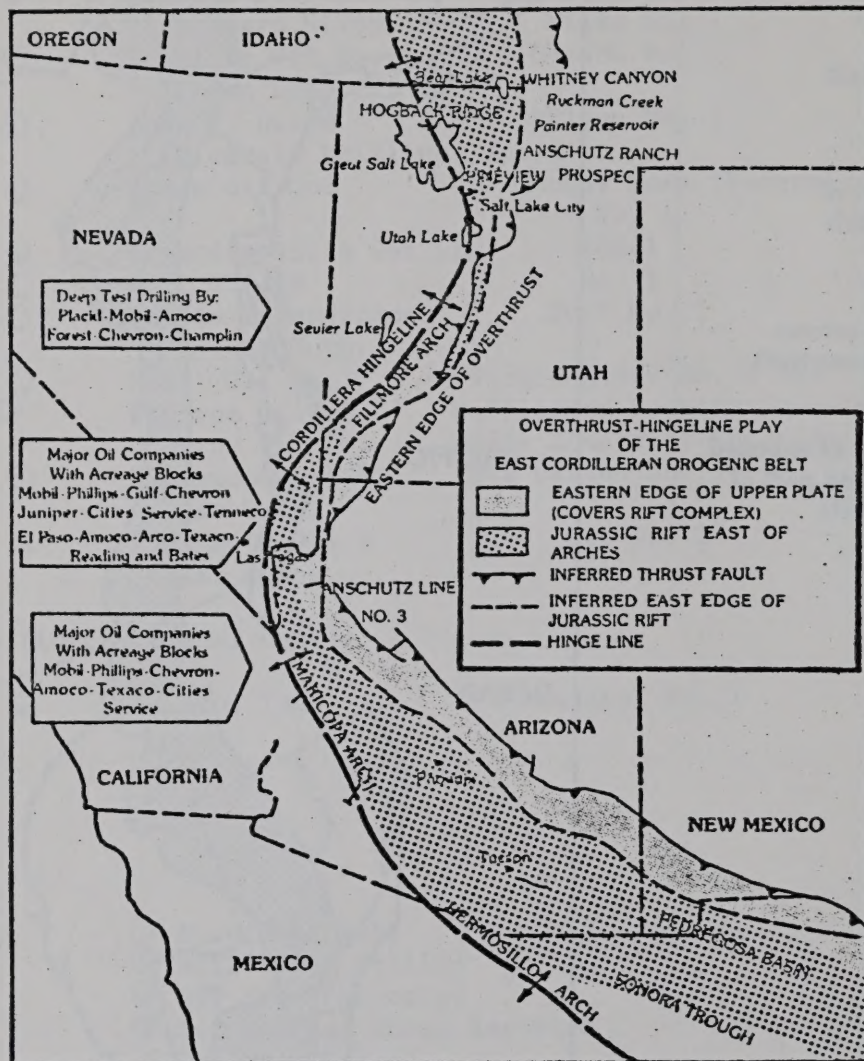
THE OVERTHRUST BELT IN NORTH AMERICA



Source: USDI, BLM, 1980.

FIGURE .42-5

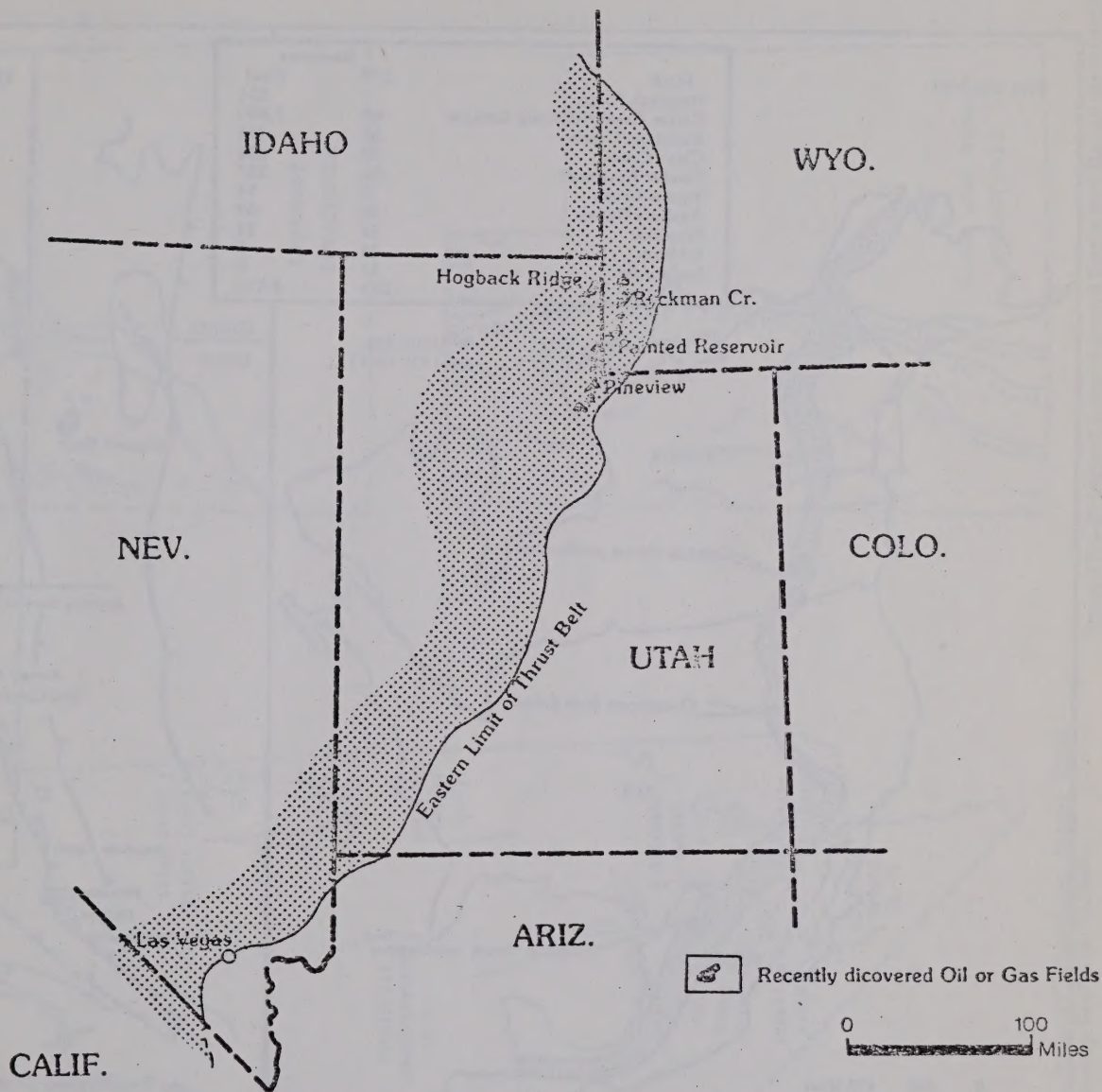
INTERPRETATION OF THE OVERTHRUST BELT
FROM THE ANSCHUTZ CORPORATION



Interpretation of where the Overthrust Belt and Cordillera Hingeline occur in Arizona and Nevada from the Anschutz Corp. (*Oil and Gas Journal*, July, 1979)

FIGURE .42-6

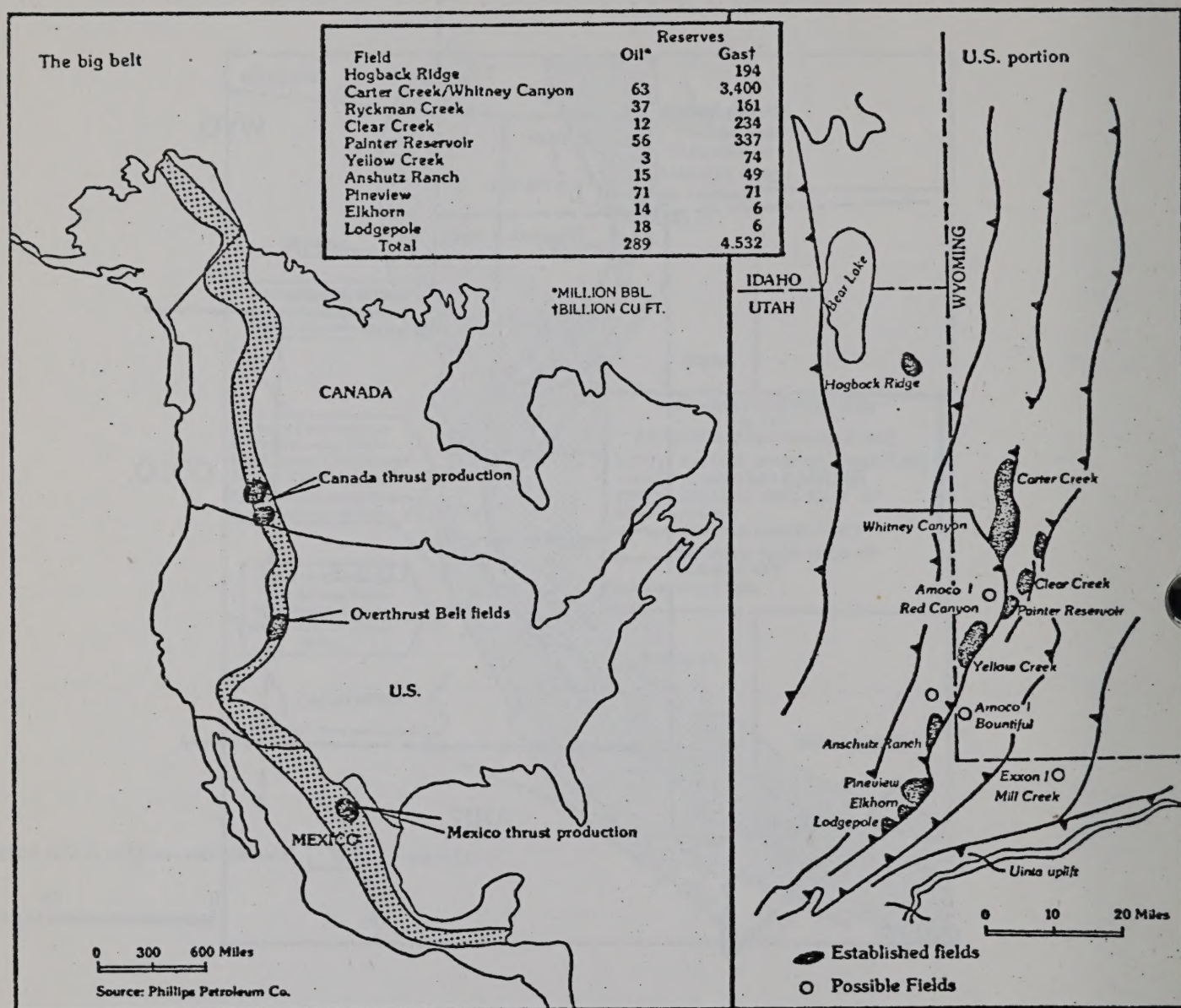
INTERPRETATION OF THE OVERTHRUST BELT
FROM CHEVRON, INC.



Interpretation by Chevron, Inc. (1979) of where the Overthrust Belt occurs in Nevada and Utah. Western Limit is not defined.

Source: USDI, BLM, 1980.

FIGURE .42-7

GENERAL OVERVIEW OF THE OVERTHRUST BELT
AND RECENT DISCOVERIES

General overview of the Overthrust Belt with detail showing recent discoveries of oil and gas fields and table showing quantities of reserves in those fields. (Oil and Gas Journal, May 12, 1980)

FIGURE .42-8

SELECTED THRUST AND STRIKE-SLIP FAULTS IN NEVADA

Sources:
Utah Bull. 73, 1964, page 27 and
Nevada Bull. 65, 1964, page 35.

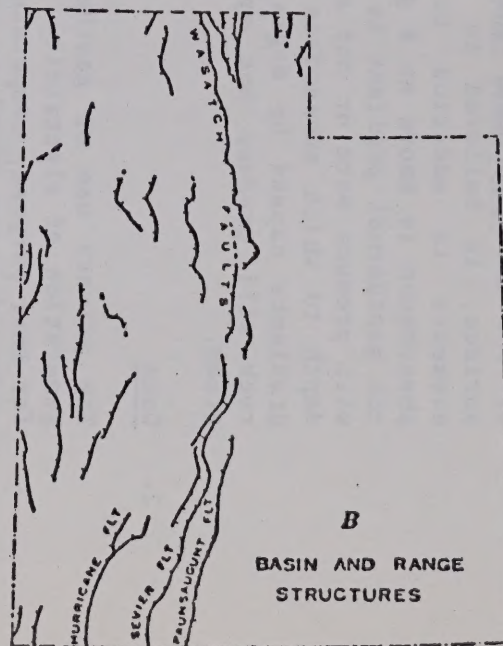
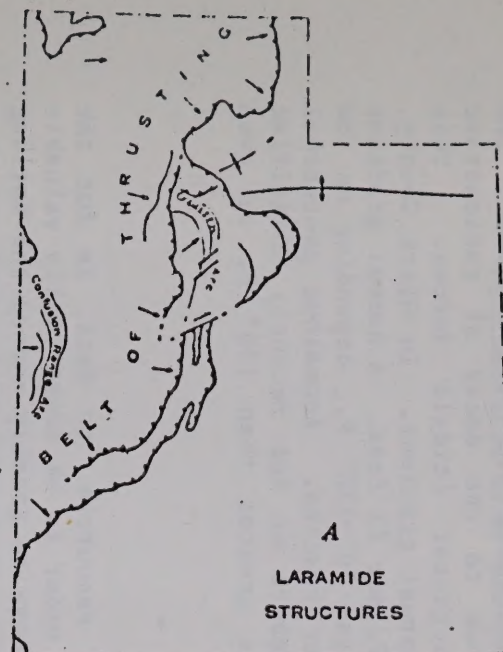


FIGURE 7.—Principal Laramide and Basin and Range structures of Utah.

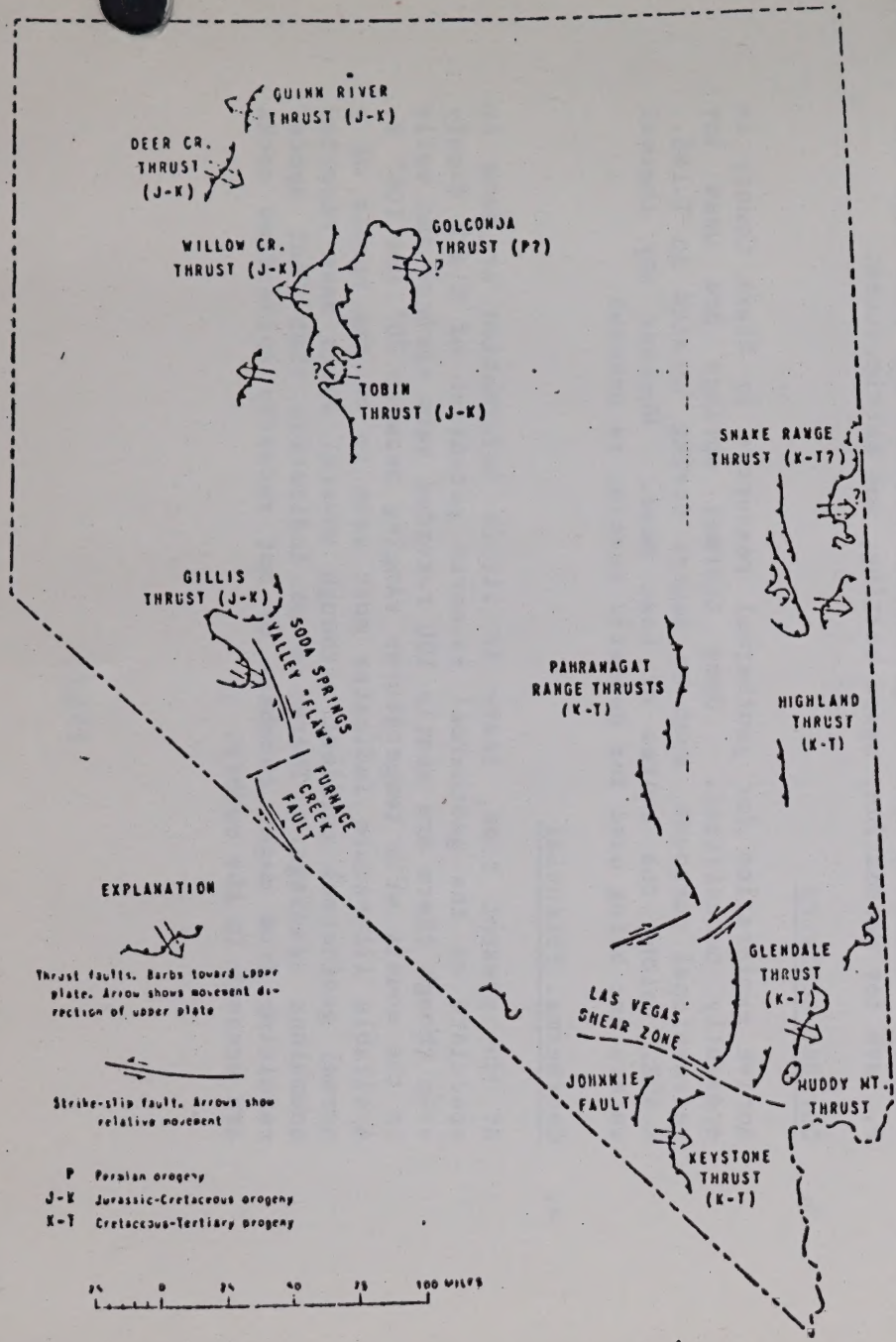


FIGURE 10.—Thrust faults exclusive of the Roberts Mountains thrust fault (shown in fig. 9), and selected strike-slip faults in Nevada.

E. Geothermal Resources

1. Geology

Geothermal energy is simply the natural heat of the earth which manifests itself as warm or hot water or steam. The source of the earth's heat, which increases with depth beneath the surface, is believed to be due to the decay of radioactive elements in addition to frictional (tidal) forces. This phenomenon is known as a geothermal gradient. In Clark County, the geothermal gradient is 1° F. per 75 feet. A normal gradient will produce warm or hot springs, 70°-130° F., depending on the depth to which subsurface water reaches. Anomalous geothermal gradients caused by magma chambers or hot recently solidified rock will produce hot springs greater than 150° F. or even steam.

2. Uses

The primary use of geothermal resources, to date, is for the generation of electricity. In order to be commercially valuable for this purpose, temperatures have to greatly exceed the boiling point of water (360° to 400° F.), steam has to be produced at a pressure significantly exceeding atmospheric pressure, and the quantity of steam has to be of such magnitude that the value of the potential power production would justify the capital investment of any installation. Dry steam is preferred because of the relatively higher return of energy over wet steam or water fields. Secondary uses of geothermal waters, say less than 150° F., are for recreation, space heating, and horticulture.

3. Current Activity

Active exploration for geothermal resources in Clark County is presently nonexistent. Some thermal springs are used for recreational purposes, such as Rogers Spring located in T.18S., R.68E., along the shores of Lake Mead. Whether any thermal waters are being used for domestic heating is unknown.

4. Geothermal Potential

At the present time, there is little information or data to speculate on the geothermal resource potential of Clark County even though there are nearly 100 recorded warm springs and wells in the county with temperatures ranging between 70° and 106° F. Available literature indicates most seem to be the result of a normal geothermal gradient although several wells have reported anomalous readings. There is no indication that "hot spots" resulting from magma chambers or hot recently solidified rocks are present in the county.

5. Resource Classification

The extent and potential of the geothermal resource have never been fully evaluated. Numerous hot springs and wells, some with anomalous gradients, are present in the county. For these reasons, all of Clark County is classified as a speculative undiscovered area for geothermal resources.

F. Management Opportunities

Management opportunities differ from the other resource activity opportunities in that the basic resource is nonrenewable. The resource is hidden from view by overburden, and, therefore, costly and difficult to inventory.

Locatables

The General Mining Law of 1872 (17 Stat. 91, as amended 1976) states that citizens of the United States may enter and explore public lands, and if "valuable mineral deposits" are located, title to the land on which such deposits are located may be obtained. The intent of the law, then and now, is to promote, foster, and encourage the development of federal mineral resources by private industry. The Mining Law is the one of the last examples of laissez-faire policy. In other words, the miner's right on public land is not a discretionary right subject to approval or disapproval by BLM. It is a statutory right granted by Congress and supported by numerous court decisions.

Furthermore, those who enter the public domain for the purpose of exploration cannot be treated as trespassers. By staking a claim, the doctrine of pedis possessio (possessory rights), assumes that the claim is valid, unless proven otherwise (Maley 1977). The mining claimant is not a trespasser in the legal sense, nor is he a permittee or licensee of the Bureau. For all practical purposes, he is accountable to no one.

The federal mining laws also give locators and owners of mining claims, the right of ingress and egress across public domain to their claims for purposes of maintaining the claims and as a means of mineral removal.

Our agency, therefore, has few opportunities for management under current laws and regulations. In a sense the Mining Law has made the management decision to mine. Laws and regulations give the miner free access to prospect/explore for minerals on public lands and leave him free to mine and remove them without charge. Prior to FLPMA, BLM had virtually no control over claimants or their mining operations. Consequently, the only realistic opportunity left to the BLM is one of protection of the mineral resource - keeping public domain open to the operation of the mining law and not withdrawn from mineral entry.

With enactment of the surface management regulations (43CFR 3809) on January 1, 1981, BLM acquired a tool to a limited degree for managing locatable mining activities. The primary objectives of these new regulations are to 1) provide for mineral entry pursuant to the mining laws in a manner that will not unduly

hinder such activities but will assure that these activities are conducted in a manner that will prevent unnecessary damage and provide protection of nonmineral resources of the federal lands; and (2) provide for reclamation of disturbed areas.

Basically, the regulations require any claimant/corporation to file a "Plan of Operations" with BLM if surface disturbance exceeds 5 acres per year. Upon receipt, BLM reviews the plan, prepares an Environmental Assessment (EA) to assess operational impacts, determines if any part of the operation is unnecessary or undue, and develops mitigating measures if necessary to be incorporated into the plan before its approval.

If surface disturbance is less than 5 acres per year, the mining operation need only file with BLM a "Notice" which is not subject to approval. It is left up to the operator to reclaim disturbed areas pursuant to standards outlined in 43CFR 3809.1-3(d). Casual use activities, such as geologic mapping, sampling, or geochemical or geophysical surveys, require no notification or approval by BLM.

At the present, the State of Nevada has no agency/division which monitors all types of mining activities. If and when Nevada does establish a "department of environmental quality," BLM should develop a cooperative agreement with the State to possibly avoid a duplication of efforts in areas such as field exams, bonding, and regulatory compliance. Such an agreement would benefit all parties concerned, particularly the mining claimant.

The Locatable Minerals Overlays indicate the historic areas of mineral production. Within and near these areas public domain should be left open to mining law operation. In those districts that fall in mountainous terrain, flat valley floors could be expected to be utilized as millsites to support the mining operations. However, because no field inventory was accomplished for the URA, prior to any action that would affect the availability of minerals, a complete mineral inventory should be completed.

For locatables, the outlook for the future is good. Those districts that in the previous section were identified as containing precious metals (gold and silver) will be experiencing an increase in exploration activity. The basis for this is price. In July of 1973, gold was selling for \$116.00 per troy oz. In July of 1980 gold was selling for \$665.00 per troy oz. - an increase of 573%. Silver was selling for \$2.24 per oz in March of 1973. In July 1980, silver was selling for \$16.54 per oz. - an increase of 738%. Local, national, and international demand far exceeds supply.

For base metals - lead, zinc, copper and manganese - the outlook is less encouraging. Price increases have occurred, although not on the same scale as precious metals. Table .42-9 summarizes the price changes.

TABLE .42-9

BASE METAL PRICES

	<u>March 1973</u>	<u>July 1980</u>	<u>% Change</u>
Copper	\$0.55/lb	\$0.95/lb	73
Lead	0.15/lb	0.53/lb	253
Manganese	0.33/lb	0.70/lb	112
Zinc	0.19/lb	0.40/lb	110

With an average inflation rate of 11% per year, in 7 years, it is obvious that the change in base metal prices is not as spectacular as for the precious metals. Additionally, much of the demand is supplied by foreign imports, making the opening of new, domestic mines less probable. Minor exploration in those districts as identified for the occurrence of this group of metals is expected.

For industrial minerals, nonmetallics, the outlook is good with increased exploration activity. Chemical-grade limestone, used in cement-making and hence, construction is in demand. Gypsum, used as a soil conditioner and major ingredient in plaster and wallboard is in demand, also. The demand for silica-sand (primarily locatable, but leasable in special areas), used for glass making is expected to increase over the next 5 years.

Leasables

In the leasable category, the demand for oil and gas will continue to increase over the long-term while supplies shrink. The temporary "glut" on the market is apparently due to a significant short-term decrease in petroleum usage due to credit controls and the recession underway in many portions of the country. Activity all over the Overthrust Belt will continue at the record levels of FY-80. Geophysical field season usually extends from September to June.

The overall outlook for oil and gas development within Clark County is for continued leasing, geophysical exploration, and more wildcat wells.

Because two environmental assessments have been prepared covering both planning units, approximately 80% of available federal lands have been leased.

For other leasable minerals, such as sodium, exploration activity is expected to continue in the White Basin area.

The entire county should have the opportunities for protection, and allowance for the future identification of oil and gas resources. Once the leases are issued, the lessee has the right of geophysical exploration and development in these leases. Support will be required in processing rights-of-way and associated temporary use permits. Noncompetitive leasing of this area should continue.

Salables

Management opportunities for sand and gravel fall into three broad categories:

- 1) Opportunities for development, based on quality, haul distance, and quantity.
- 2) Opportunities for further identification and quantification
- 3) Opportunities for protection

Unfortunately, expansion of Las Vegas has left the Valley with only a few critical sources of material. Nellis, Sunrise, and Ann Road community pits receive most of the use. Haulage distances of 20 miles are becoming common today.

Gravel operations are not compatible with urban expansion because of associated noise, dust, and unsightliness. Urban expansion in the Valley in a southwestward direction has forced closure of the Arden pit - the only source of sand and gravel in that sector of the city. No supply exists in the southeastern portion of the city. Community pits could be established in the Los Angeles Freeway district. Section 16 pit should be given a 1/2 mile buffer zone for future expansion, since it is envisioned to be the only source for the west sector of the city. No developments within that buffer should be allowed which could in the future jeopardize expansion. The Jean area should be explored and should sufficient reserves be delineated, set aside as future gravel reserves. The two mining claims recently declared null and void, Airway #13 and Blender #1, should be reserved as future gravel reserves. Since the Ann Road pit is nearing depletion and housing is encroaching on it, another pit in the Tonopah Highway district should be established. With the private supply as well as these reserves, it is hoped that we can meet the demand of the next 5-10 years.

Table .42-10 summarizes the community pits in Clark County. The management opportunity for protection should apply here. Additionally, trespass is a significant problem. Because no means of verification of volume removed exists, it can be assumed with a high degree of probability that the 68,656 cubic yards figure is half of the total amount actually removed. Management should also protect these pits to assure excess material is not removed. The NDOT has removed approximately 400,000 cubic yards of material from free-use permits and right-of-way sites. Approximately 30,000 cubic yards of material were sold under contract in FY-80, and approximately 150,000 cubic yards removed from the Airway and Blender mining claims. This represents a total of 717,000 cubic yards (1,076,000 tons) or approximately 20% of demand. Outside the Valley, no management problem exists - supply far exceeds demand.

To conclude, the following management opportunities exist:

1. The Section 16 pit should be given a 1/2 mile buffer zone for expansion. No BLM actions within that zone should be allowed which could jeopardize future expansion.
2. The Jean area should be explored and evaluated. Should sufficient reserves be delineated, the area should be withdrawn from mining location and set aside as a future "gravel reserve." This should be accomplished in conjunction with gravel operators.
3. The two mining claim areas - Airway and Blender-should be withdrawn from mining location and set aside as a future "gravel reserve," and community pits established.
4. Establish another community pit in the Tonopah Highway district to replace the Ann Road pit.
5. To mitigate the trespass problem of control of material removal in the community pits in Las Vegas Valley.
6. Establish a "gravel reserve" in the Nellis community pit area.
7. Continue to work with sand and gravel operations in the Las Vegas Valley to meet site-specific demands for construction materials.

TABLE .42-10
Clark County
COMMUNITY PITS
Total Sales - FY-79

	Yd3	\$	# Sales	Remarks
Ann Road	6,648	1,064	14	
East CP	14,150	2,547	14	Closed 1979
Gypsum Wash	0	0	0	
I-15 Waste Piles (CUA)	3,893	584	4	
North Jean Lake	0	0	0	Opened 1979
South Jean Lake (CUA)	335	67	2	Plaster & Mortar Sand in Washes
Logandale CP	0	0	0	
Mesquite Helms	2,400	528	3	
Mesquite Rip Rap	0	0	0	
North Mesquite CP	0	0	0	
South Mesquite CP	1,200	264	3	
Overton	0	0	0	
Overton West	4,000	600	3	
Sandy Valley	3,200	512	2	
South CP	380	76	3	Closed 1979
Sunrise	10,900	1,980	7	
Unnamed Pit Sec 14, T25S,R59E	2,500	425	1	
Unnamed Pit Sec 17, T19S,R60E	1,500	300	1	
Unnamed Pit	2,500	500	1	
Camp Bonanza	1,000	220	1	
SW 4 Sec 6, T17S-R57E				
Flamingo CP	100	25	1	
NW 4 Sec 22, T21S-R60E				
TOTAL	68,656	\$11,785.50	84	

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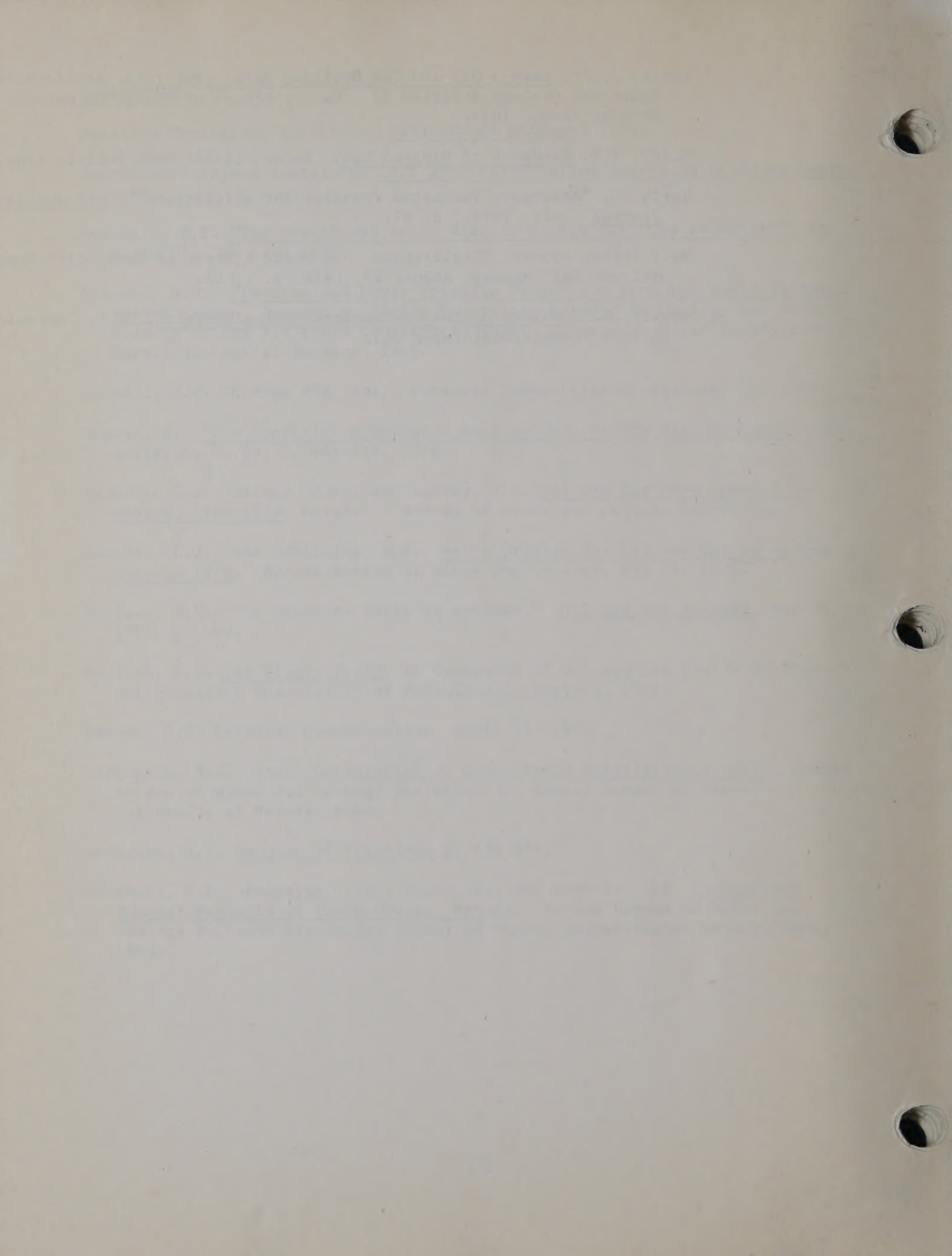


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.43 FOREST PRODUCTS

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.43 Forest Products

Overlays

One overlay has been prepared for each planning unit, showing inventoried lands. Commercial woodlands, as described in Forest Land Inventory Classifications, are identified. Communities of vegetation other than commercial woodlands are also depicted. A recommended protection area for Douglas fir is shown on the Virgin Valley Planning Unit Overlay.

Timber Atlas

Any timber atlases available for the county depict only broad ecological ranges. For site-specific information on species in this area refer to the Forest Products Overlay.

Tabulations

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Forest Land Classifications

Forest products in Clark County are predominantly mixed pinyon (Pinus monophylla), and juniper (Juniperus osteosperma) woodlands. Widely scattered stands of ponderosa pine (Pinus ponderosa), bristlecone pine (Pinus aristata), Douglas fir (Pseudotsuga menziesii), White fir (Abies concolor), and quaking aspen (Populus tremuloides) are found at higher elevations. None of the county woodlands have site potentials or annual production levels capable of meeting the criteria for classification as "productive (commercial) forest land" (areas capable of producing at least 20 cubic feet per acre per year of commercial tree species). However, these woodland types are of commercial value for cordwood, Christmas trees, and fence posts, and will from here on be referred to as commercial woodlands.

There are 3,097,131 acres of BLM administered lands in Clark County, of which 207,236 acres can be classified as commercial woodlands. The county was inventoried in the summer of 1979 using a woodland inventory method of tenth-acre permanent plots established on a fixed 5,000 meter military grid pattern. This method was developed in 1978 and 1979 by the BLM, Ely District Forestry staff.

Analysis of Productivity

Potential for productivity is based on an analysis of site quality, present stocking, and regenerative capability. Data for

this section is taken from the 1979 forest inventory. This information, as applicable, is depicted on the Forest Products Overlays.

Site Quality: All forested land in Clark County is classified as commercial woodlands. Since the first forest inventory conducted in this area was in 1979, no site quality or site potential tables are available. This type of information can be formulated after the forest inventory is repeated and comparative data is available to establish regeneration rates, growth rates, and volume production per year.

Field observations during this inventory would indicate that plots 0401 through 0406 in the Stateline Planning Unit (Christmas Tree Pass and McCullough Mountains) are of low to moderate site quality, plots 0407 through 0437 (Spring Mountains) are of moderate to very good site quality, and plots 0201 through 0206 in the Virgin Valley Planning Unit (Gold Butte Range and Virgin Mountains) are of moderate site quality. Site quality is the estimated potential of an area to produce wood. The estimates in this case are necessarily rough because of the single inventory; however, these projections will be refined as more data becomes available.

Stocking: Information on stocking is also limited. The 1979 inventory, however, showed stocking to vary from 10 percent to as high as 80 percent (estimated as percent canopy cover). Stocking rates also correspond closely to projections made for site quality by plot. For example, plots with low site quality also had a low stocking percent.

Regenerative Capability: Inventory data showed from 0 to as many as 5 seedlings per hundredth-acre plot (hundredth-acre subplots around the center points of the tenth-acre inventory plots). Numbers of seedlings did not show correlation to site quality or stocking rates. It is doubtful that any restocking programs would be feasible due to the slow average growth rates of pinyon and juniper in the relatively harsh local environment. Any other species present are too limited in quantity to be used commercially.

Potential Production: From volume figures calculated in the 1979 inventory, it is apparent that the area covered by plots 0407 through 0437 in the Stateline Planning Unit have the greatest potential production of cordwood and fence posts. It is doubtful that any other production is feasible, with the exception of pine nuts in high productive years. The areas covered by plots 0201 through 0206 in the Virgin Valley Planning Unit and 0401 through 0406 in the Stateline Planning Unit are marginal areas, capable of producing only small amounts of fence posts and cordwood.

Christmas tree sales are not feasible at all in Clark County because the demand for Christmas trees from the metropolitan Las Vegas area would soon outstrip any available trees. The 1979 inventory showed an average of less than one Form Class I (prime quality) Christmas tree per plot.

Tabulations

Table .43-1 shows the volume in cubic feet per plot, by species, of commercial woodlands in Clark County. Species totals are also shown for average cubic volume per acre as well as gross cubic volume per inventory area. The data shown are interpolated estimates derived from the most locally applicable volume tables (Clendenen 1979) and rounded to two significant digits. Interpolations were required to adjust for the differences between the species and sampling techniques used in Clark County and those used in establishing the volume tables. These differences include:

1. The Clark County forest inventory considered single as well as multiple-stemmed individuals of the genus Juniperus. The volume table used only considered single-stemmed trees.
2. The species of pinyon identified in this inventory was Pinus monophylla. The species used in the volume table was Pinus edulis.
3. The Clark County inventory estimated volumes down to a two-inch minimum top diameter. The volume table established volumes down to a one-inch top diameter. These data will be adjusted for local species and ecological conditions upon completion of the required data processing of the inventory results.

Table .43-2 shows the volume of cordwood, fenceposts, and pine nuts (pounds) sold in the county for the last six years. These are the only vegetative products sold in Clark County because current District policy does not allow for sales of Christmas trees in the county, and current State and District policies do not include guidelines for fair market values for other vegetative products, such as cacti and other desert vegetation.

Free use programs, with the exception of use by nonprofit organizations, were curtailed in the fall of 1977. As a result, no free use figures will be depicted. Any free use which does take place is of such minor amounts that it need not be addressed.

TABLE .43-1
Clark County

VOLUME OF COMMERCIAL WOODLAND

Plot No.	Pinyon ft 3/plot	Juniper ft 3/plot	Total ft 3/plot
Virgin Valley Planning Unit			
0203	9.48	0	9.48
0204	0	11.20	11.20
0206	31.34	14.86	46.20
Stateline Planning Unit			
0401	0	6.49	6.49
0402	0	11.05	11.05
0403	0	0	0
0404	5.30	76.64	81.94
0406	5.96	17.14	23.10
0407	1.92	46.97	48.89
0408	14.26	5.55	19.81
0409	0	41.17	41.17
0410	12.23	33.71	45.94
0411	1.15	39.91	41.06
0412	.17	6.89	7.05
0413	11.54	9.79	21.33
0414	13.65	0	13.65
0416	7.21	169.03	176.23
0417	9.49	0	9.49
0418	23.88	0	23.88
0419	6.62	0	6.62
0421	3.39	6.35	9.74
0422	2.67	0	2.67
0423	10.65	54.12	64.77
0424	7.18	48.84	56.02
0425	1.37	8.03	9.40
0426	2.43	25.68	28.11
0427	8.91	24.68	33.59

TABLE .43-1 (continued)

Clark County

VOLUME OF COMMERCIAL WOODLAND

Plot No.	Pinyon ft 3/plot	Juniper ft 3/plot	Total ft 3/plot
0428	19.59	15.95	35.54
0429	10.97	0	10.97
0430	20.34	45.89	66.24
0431	12.98	52.44	65.42
0432	18.36	61.14	79.49
0433	67.71	0	67.71
0434	0	0	0
0435	0	0	0
0436	9.12	63.23	72.35
0437	45.03	21.68	66.71
Average Vol/Acre	106.73 ft ³	248.22 ft ³	354.95 ft ³
Gross Volume	22,118,242.27 ft ³	51,441,016.08 ft ³	73,558,138.15 ft ³
(+ at t(n) .20)	(+ 6,140,402.68)	(+ 14,705,466.56)	(+ 15,563,423.60)

TABLE .43-2
Clark County

VOLUME OF FOREST PRODUCTS SALES

Fiscal Year	* Cordwood (cbs)	* *** Fenceposts (number)	* Pine Nuts (lbs)
1974	10	1,500	---
1975	600	100	---
1976**	1,500	100	---
1977	1,600	500	500 approx.
1978	1,200	500	400 approx.
1979	1,500	1,000	400 approx.

* Figures are approximately rounded to the nearest 100.

** Includes 3 month Transition Quarter.

*** Figures are estimated and include products sold in the Esmeralda Planning Unit.
Estimates are that Clark County volume is less than 25% of these totals.

Source: USDI 1974-1978; District ADP Reports.

Loss of forest products to fire, insects, or disease is highly variable. At present, no real problems have been identified with insects or disease. Fires can vary from as little as 40 to 50 acres per year, to as high as 1,000 to 2,000 acres or more per year. Annual fire losses are so variable that only an average can be predicted. It is estimated that 150 to 250 acres per year, over a period of 10 years or more, would be the average loss to fire.

No evaluation of other vegetative products (such as cacti, yucca, or other succulents) has been completed other than by the range or forest inventories. Areas of concentration have been shown on the overlays without specific type boundaries; therefore, no acreages can be estimated for other vegetative products.

The Las Vegas District's present policy does not allow the sale of other vegetative products. Free use of other vegetative products is confined primarily to collections for research purposes. Some free use has also been made on sites scheduled for destruction; however, no total use records have been kept for such activities.

Narrative

Ecological and Site Factors

Pinyon and juniper are found between 3,200 and 9,000 feet in elevation. Pinyon is generally not found lower than 4,500 feet unless it is associated with slightly alkaline soils. Caliche-type soils are common in areas with better soil development (Fowells 1965). Juniper growth normally begins at around 3,200 feet, and the trees are commonly found on stony and shallow soils having lime-cemented subsoils. These soils are often subject to rapid erosion (Fowells 1965). Juniper does not generally grow above 8,400 feet elevation.

Ponderosa pine is found scattered in small stands in the Spring Mountain Range. These trees are found in loose-textured, moist to slightly dry, upland soil types and are generally not found below 7,000 feet in elevation. Ecological tolerances are so close in southern Nevada that most stands are capable only of sustaining themselves.

Bristlecone pine is found above 8,000 feet on the west side of the county in the Spring Mountains and on Mount Potosi, and is generally found in coarse, poorly structured, moist to slightly dry, upland soils. This species has a strong dependence on elevation and associated temperature regimes, and has a high moisture requirement.

White fir is common above 7,500 feet in the Spring Mountain Range. It is normally found on coarse, well-drained, moist to slightly dry upland soils. The range for white fir is limited by its high moisture requirement.

The Virgin Mountains contain several small patches of Douglas fir totalling about 300 acres. This is the only presently known stand of Douglas fir south of Ely in Nevada. The nearest seed source is located 60 to 75 miles away, north of St. George, Utah. These stands are found between 5,800 and 7,200 feet in elevation in moderately textured, moderate to well-drained, slightly acid soils. This species is presently sustaining itself and does show signs of some regeneration. It is likely, however, that fire, disease, or insects, could be devastating to the stands.

Quaking aspen, though not identified on BLM administered lands in Clark County, is present on the Toiyabe National Forest.

In summary, distribution of trees and related vegetation is controlled primarily by elevation and the corresponding characteristics of precipitation and evapotranspiration rates. Soil is generally of secondary importance in determining what species grow in a specific site.

Problems

Site Quality: Pinyon and juniper have slow average growth rates. Pinyon averages 3 to 4 feet tall at 25 years of age. Juniper averages 13 to 14 feet at 40 years. The harsh environment of the county is reflected in the shallow, undeveloped, highly calcareous, fine-textured soils. Low precipitation and high evaporation rates are normal. Site quality would be low to marginal for "forest" production. This projection is often reflected in the size and growth form of existing tree species. Several of the better quality sites could shorten the growth time projected above.

Site quality can most easily be projected in terms of cordwood production per acre (C/A). Cordwood production in pinyon-juniper can vary from 2 to 4 C/A along the lower growth limit to 40+ C/A in good stands (Randles 1949).

The 1979 inventory showed a countywide average of 5.37 C/A (354.95 cubic feet/acre). This was subject to drastic variation from site to site.

Inventories show opportunities for establishing designated cordwood cutting areas and/or small controlled burn sites in the Spring Mountain area. This opportunity also exists for cutting fence posts.

Stocking: Pinyon-juniper stands within the county range from poorly stocked to well-stocked. Thinning or restocking programs in pinyon-juniper stands are not really feasible from an ecological standpoint because of the characteristic slow growth and regeneration rates. Any management program should be built around commercial and personal use of firewood and fenceposts.

Regeneration: Regeneration of pinyon-juniper is at least adequate for maintenance of the species on current growing sites. The present stands of trees have resulted from biological factors that have been at work for many hundreds of years. Burned areas begin to become reforested in only a few years. If left untouched, it is probable that these areas could be well-stocked in 30 to 40 years.

In areas where pinyon has been selectively cut, the existing environment or microclimate is not appreciably altered, and there is evidence of fair to good reproduction. Cutting of juniper trees on a selective basis also would not be likely to alter the microclimate sufficiently to impair reproduction.

There may be difficulty in achieving natural reproduction after thinning or selective harvesting in low-density pinyon and juniper stands. Little difficulty would be expected in achieving reproduction after selective harvest in stands made up of 50 percent or more pinyon pine or juniper by vegetation composition.

Trespass: Reports of theft of ponderosa pine for firewood are not uncommon. The effects of these thefts, although relatively minor at present, may easily become detrimental to production of ponderosa pine due to its limited growth, range, and site suitability. Control of trespass is difficult because of the limited number of BLM personnel available for patrol.

Combined efforts of the Nevada Division of Forestry, U.S. Forest Service, and BLM could eliminate most trespass. Also, qualifying selected BLM foresters for Nevada Forester/Fire Warden cards would authorize those field personnel to write citations on Nevada State Statutes, including those pertaining to woodcutting without a permit, transporting without a permit, and others.

Christmas tree theft is known to have occurred near the Mount Charleston area. Information which would lead to trespass action against this type of theft is limited. The large size of the county and lack of patrol personnel also contribute to this problem.

Unauthorized removal of firewood and fence posts also occurs, but is minor at present. The potential exists for increasing

firewood trespass as a result of the greater demand for wood as a home heating fuel.

Historical Uses and Events

Historically, limited cutting has occurred in the woodland areas of Clark County. Cutting has been generally localized in the vicinity of townsites, ranches, and mining operations.

During the 1860s, most of the accessible ponderosa pine and pinyon-juniper was cut for sawtimber. Large amounts of these types of wood products were cut for mine timbers, charcoal kilns, railroad ties, fence posts, and many other uses during the 1860-1890 period.

During the 1930s, the Civilian Conservation Corps cut thousands of juniper posts for range improvement fences.

In the past there have been several large fires around Mount Charleston and Virgin Peak. There have not been many large fires in recent years, though there are usually more than 15 lightning fires started in the county each year.

Fire, insects, and diseases have had little noticeable impact on either the commercial potential or the long-term stocking levels of forest products in Clark County.

Access

Access to the Virgin Mountains, Gold Butte Range, Christmas Tree Pass, New York Mountains, and McCullough Mountains is poor. These areas have limited potential for production. Access in the Spring Mountains is fair to poor. Sites with potential for sale areas have reasonable access. No major projects for road construction can be identified at this time. The majority of roads in the Spring Mountains will require maintenance when a sales program is initiated.

Other Land Uses

There are several presently occurring impacts on forest lands within the county. Livestock grazing currently constitutes one of the largest impacts. Virtually all forested lands in the county fall within the grazing allotments administered by BLM.

Commercial harvest of forest products in Clark County is nonexistent at the present time. However, there are indications that commercial harvesting for home heating firewood will develop as a result of energy shortages and rising fuel prices.

Free Use

The major free use in the county is the collecting of pinyon pine nuts. Only small quantities of commercial use permits are sold annually.

The majority of use is made by local individuals, however, it is not uncommon to see Utah and Arizona license plates on vehicles parked along backroads during the pine nut harvest season. The pine nut is a traditional food of the Indians of the Southwest, but gathering by Indians is generally undocumented.

In October, 1977, free use permits for Christmas trees and firewood were authorized for senior citizens and the handicapped. Because of some uncertainties about the program, it was only lightly advertised, and only in Lincoln County. Demand in the Las Vegas area was negligible. In December, 1977, issuance of all free use permits except to nonprofit organizations (total value not to exceed \$100/year) and research groups was curtailed indefinitely (43 CFR 2.48D).

Opportunities exist to issue free use permits for forest products or other vegetative products on lands designated for destruction, such as road rights-of-way, material sites, etc.

Other Vegetative Products

Other vegetative products in Clark County are primarily desert vegetation. The most important of these products include several species of yucca and cacti. As previously mentioned, the Las Vegas District's present policy does not allow the sale of these products. The only authorized use to date has been in the form of pre-destruction free use permits for research collections.

Trespass has been a problem in certain areas, especially within Virgin Valley in proximity to Interstate 15.

A policy should be developed regarding the disposal (sale or free use) of desert vegetation. Increased monitoring and compliance checks will also be required.

The Arizona Strip District (BLM) is presently selling joshua trees, barrel cactus, and cholla for use in fertilizer. An opportunity exists to sell these products in limited quantities. The appraised sale prices used by the Arizona Strip District are \$10 per joshua tree and \$5 per cactus (all species). Potential sale areas on the Las Vegas District are depicted as areas of concentration of other vegetative products on the Forest Products Overlays. Opportunities to allow sales for ornamental use also

exist but an appraisal to establish sale prices would be required.

Conditions and Trends

No condition and trend problems have been identified for the forest and other vegetative products resources in Clark County.

One site on Virgin Peak contains the only known stand of Douglas fir in the county. This area is recommended for protection from fire and woodcutting because of its rare and unique character here in Clark County. The boundary of this protection zone is shown on the Virgin Valley Planning Unit Forest Products Overlay.

Small prescribed burns done in 5- to 10-acre blocks may be beneficial to Douglas fir. Any such program will have to be conducted under a very strict prescription and with enough personnel to provide sufficient protection for the Douglas fir stands involved.

Water Needs

No forest management programs are currently being conducted which require water usage. However, there has been interest expressed by local nurserymen for use of public land for plant propagation. This would require some water usage.

Summary of Opportunities

Management opportunities presented in Forest Products are as follows:

Allow limited commercial sales of cordwood within designated cutting areas in the Spring Mountain Range in conjunction with the Toiyabe National Forest's cutting programs.

Allow personal sales of cordwood, according to current District policies, in all forested lands in Clark County and in designated cutting areas in the Spring Mountains.

Allow sales of fence posts in all forested lands within Clark County.

Continue the forest inventory program on a regular basis to develop stocking and site quality data sources and to revise existing data.

Develop a prescribed burning program in Clark County for site improvement and wildlife habitat improvement, with emphasis placed on areas which are relatively inaccessible,

e.g., Virgin Mountain Range, Gold Butte Range, etc. However, before any burning takes place in the Spring Mountain Range, this area should be utilized as designated cutting areas a minimum of two years, or longer if demand warrants, before any burning is conducted. This is in accordance with current BLM policy.

Develop a prescribed burning program in the Douglas fir stands in the Virgin Mountains for the purpose of improving stand quality and condition.

Protect all unique or rare tree species in the county from wildfire. Species involved are ponderosa pine, white fir, bristlecone pine, and possibly aspen in the Spring Mountain area, and Douglas fir in the Virgin Mountains.

Obtain Nevada Forester/Fire Warden cards for selected BLM forestry personnel to provide authority to write and issue citations on Nevada State Statutes for trespass and illegal cutting or removal of certain species of forest and desert vegetation.

Allow free use disposal of desert vegetation on sites destined for destruction (i.e., road rights-of-way, material sites, etc.).

Allow limited sale of desert vegetation, such as joshua trees, barrel cactus, yucca species, and cholla, from areas having high concentrations for use in fertilizer.

Allow sales of desert vegetation for ornamental and landscaping use. An appraisal should be conducted to establish appropriate sales prices.

Continue to allow commercial sale of pine nuts in years of high production.

Allow leasing of public land in proximity to Las Vegas for the purpose of desert vegetation and low water demand plant propagation by local nurserymen.

No other opportunities for forest and other vegetative products management are technically feasible at this time; however, opportunities will develop and should be incorporated as management programs are established.

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Overlays

Two overlays have been prepared for each planning unit. In the Virgin Valley Planning Unit the Grazing Administration Overlay shows present allotment boundaries, normal season of use by allotment, and problem areas. The Range Suitability Overlay shows the suitability of areas within each allotment for the class of livestock authorized to graze in that allotment.

In the Stateline Planning Unit, the Grazing Administration Overlay shows present allotment boundaries, normal season of use by allotment, AMPs, and problem areas. The Range Suitability Overlay shows the suitability of areas within each allotment for the class of livestock authorized to graze in that allotment.

See Grazing Administration - Wild Horses/Burros for a description of the overlays prepared for wild horses and burros.

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1. Vegetation

a. Livestock-Vegetation Relationships

General

Since 1969, Clark County has been classified as Southwest Desert Ephemeral Range. This classification means that due to marginal soils, low elevations, and minimal precipitation (annual average 4 inches), the range does not consistently produce substantial amounts of perennial forage allocatable for livestock or wildlife use. Rainshowers, although erratic in nature and generally of short duration, are often followed by a resurgence of annual (ephemeral) vegetative production. It is this annual production which sustains the bulk of livestock grazing in the county.

Ephemeral classification correctly describes a large part of the range in Clark County. Over 70 percent of the Virgin Valley Planning Unit and 28 percent of the Stateline Planning Unit were determined ephemeral because perennial production is below 25 lbs/acre and under 3,200 feet in elevation. However, 10 percent of the Stateline Planning Unit and two percent of the Virgin Valley Planning Unit produce suitable or potentially suitable perennial forage, according to the findings of the Clark County range survey of 1979. The remaining land, 28 percent of the Virgin Valley Planning Unit and 62 percent of the Stateline Planning Unit, was determined unsuitable because of excessive slope, rock, or low production above 3,200 feet in elevation.

Most of the livestock use in Clark County occurs on the allotments in which the suitable or potentially suitable perennial forage is found.

The ephemeral classification of 1969 gave range management in Clark County a relatively low priority because true ephemeral range has no potential for improvement with associated economic benefits. The grazing allotments received few studies, minimal use supervision, and low funding. Policy guidelines for ephemeral range were infrequently enforced because of the ephemeral classification and resulting low priority and funding for management programs. However, all range in the fragile desert ecosystem of southern Nevada requires relatively intensive management in order to maintain and protect even the present environmental quality.

Range users generally did not change their operations after the classification of 1969 and yearlong cow/calf operations with base herds continued. Numbers of animals fluctuated during years of good annual production, but yearlong herds, ranging from 100 head to as many as 400 head (on the Crescent Peak allotment), are authorized.

It appears from the range survey that certain allotments have been improperly classified because they have suitable or potentially suitable perennial forage, or there is a potential for improvement of perennial production under proper management. An opportunity exists to reclassify certain allotments as ephemeral/perennial and to manage for the existing perennial forage. See Tables .44-6 and .44-9 in the Range Suitability discussions for both planning units for a list of these allotments proposed for reclassification.

On all allotments designated as ephemeral/perennial, the management of the perennial vegetation takes precedence. Management objectives are to protect perennial vegetation and improve its condition and trend, plant vigor, and forage production. Grazing authorizations and periods-of-use are based on the condition and capacities of the perennial forage only. Additional AUMs may be authorized on ephemeral forage if the additional grazing use does not conflict with the objective of management for perennial production.

Grazing authorizations are determined using various methods. The grazing capacities and forage allocation will be determined through Coordinated Resource Management Planning (CRMP).

There are alternative methods of operation available to range users which would also make efficient use of ephemeral and ephemeral/perennial ranges. For example, feeder-stocker

operations, ewe/lamb operations, or dual-use (cattle and sheep) operations are all feasible alternatives to cow/calf operations on range in Clark County.

Certain ephemeral allotments in Clark County are currently unallotted. The resources on these allotments could be effectively utilized by any type of livestock operation. An opportunity exists to authorize grazing on these unallotted areas to dispose of the available forage under the provisions of the Material Disposal Act of July 31, 1947. Forage could be made available to interested range users through public auction.

Establishing periods-of-use will be necessary if allotments are reclassified as ephemeral/perennial. It is difficult to set a period-of-use on perennial plants in the Mohave Desert. It is generally believed that the plant responses are seldom identical for two consecutive years. Beatley (1969) found this to be the case on the Nevada Test Site (approximately 100 km northwest of Las Vegas). Important environmental factors regulating growth and development are distribution of rainfall and the soil and air temperatures preceding and during a seasonal growth period. The active growth period for globemallow (Sphaeralcea ambigua) for example, varied one to two months, the growth coming late following a cold spring on the Nevada Test Site (Wallace and Romney 1972).

Taking into consideration the normal fluctuations of rainfall and temperature, and the perennial plants' response to these fluctuations, a general period-of-use which will provide rest for most perennial forage species during their growing season would be June through February. This period-of-use does not provide for rest during regrowth during late summer and fall.

Annual production fluctuates with seasonal variations and precipitation patterns. In hot, dry years, the annual vegetation is sparse and dries up in a very short period, usually four to six weeks. With no autumn rains, little if any winter annuals will be present the following spring unless rains come in March and April, in which case some germination will occur but growth will be less dramatic (Beatley 1969).

In wet years, which occur only sporadically, large quantities of red brome (Bromus rubens), buckwheat (Eriogonum spp.), filaree (Erodium cicutarium), Indian wheat (Plantago insularis), and other forbs are produced and may stay green for several months. With good fall rains coming between September and mid-December, germination occurs, with vegetative growth following in late March-early April. Fruiting would range from April and May, to June in higher elevations (Beatley 1969). Optimum production seems to be reached when fall rains are followed by early spring rains.

Livestock and wild horses and burros utilize these annuals quite heavily along with any perennial grasses or shrubs available. The annual forage, particularly red brome, tends to become coarse and unpalatable late in the season as it approaches maturity. For this reason, it is common to see relatively dense patches of cured standing forage throughout the range.

Production also varies from site to site. This is apparently related to soil conditions and the "spottiness" of fall rainstorms. Results of a study done in the Stateline Planning Unit during the 1973 growing season found that areas that produce little annual vegetation are those cut by recent floods, saline areas dominated by salt bushes, tight desert pavement areas, compacted areas, and blackbrush vegetation types. Beatley (1966) also found that on soils with caliche near the surface annuals were only present under shrubs. This also seems true of the Virgin Valley Planning Unit.

As spring progresses (April through May) in the lower elevations, perennial shrubs and grasses in types which produce good annual forage, become more important in the cattle diet (Hohman and Ohmart 1980). Species probably utilized are ratany (Krameria sp.), bush muhly, (Mulenbergia porteri), big galleta (Hilaria rigida), wolfberry (Lycium sp.), shrubby buckwheat (Eriogonum fasciculatum), winterfat (Eurotia lanata), bursage (Franseria sp.), catclaw (Acacia greggii), and desert almond (Prunus andersonii). A perennial forb, globemallow (Sphaeralcea puberula), also becomes more important in the diet.

Other perennial grasses to be found are needlegrass (Stipa spp.), Indian ricegrass (Oryzopsis hymenoides), tobosa (Hilaria jamesii), and grama grasses (Bouteloua spp.). When available, they are readily utilized by livestock, including both cattle and sheep, and wild horses and burros.

In years of low annual forage production cattle must begin using the shrubs and grasses earlier in the season. This causes heavy use on perennial species.

If summer rains come early in July, summer grasses like big galleta and black grama (Bouteloua eriopoda) will green early and provide forage. During the fall and winter months the cattle diet returns to shrubs, such as Mormon tea, range ratany, and shrubby buckwheat. In addition, fall rains will cause regrowth of such grasses as bush muhly, black grama, and big galleta, which will cure well in the winter.

Creosote is widespread throughout the county and is not restricted to any one zone (see Table .34-3). While it is a

dominant vegetation species throughout both planning units, it is not a desirable forage plant. It is often associated with the yuccas as well as other desert shrubs, most notably bursage or burrobrush (Franseria dumosa) and range ratany. Burrobrush, though seldom used by cattle, is a preferred forage of sheep and wild burros, and constitutes a majority of the sheeps' spring diet. Sheep are trailed or hauled in during early spring (usually prior to lambing) to take advantage of the spring green-up and new leader growth on this species.

Winterfat (white sage), one of the more desirable shrubs with reference to grazing, can be found in scattered areas in the county. Its deep taproot makes this species extremely resistant to drought. Winterfat is usually found associated with sagebrush and other "cold desert" shrubs.

Sandy, alkaline soils, such as those in the Dry Lake region, are areas where saltbush (Atriplex spp.) is most likely to grow. These sites do not favor annual production and therefore yield little ephemeral vegetation.

Blackbrush and associated yuccas occupy the transitional zones between lower and higher elevations in the Muddy Mountains and Gold Butte/Azure Ridge areas in the Virgin Valley Planning Unit, and the McCullough Mountains and Spring Mountain areas in the Stateline Planning Unit. Little ephemeral production can be expected from these areas, probably due to the terpenes emitted from the blackbrush. The various species of menodora (Menodora spp.), readily used by livestock and wild horses and burros, may be found associated with the blackbrush or creosote and burrobrush.

In the Virgin Valley Planning Unit, Virgin Peak and the adjoining mountains support many pockets of perennial grasses such as Stipas and Boutelouas. Due to the steep and rocky terrain, however, the grasses may be inaccessible to livestock, especially cattle. Although sheep may traverse these areas more easily, they are generally herded along the mesas and canyon floors.

Mesquite (Prosopis sp.) and desert willow (Chilopsis linearis) grow in limited sites along drainages and sandy washes. The sweet-meated pods of mesquite are relished by cattle in the fall when the pods ripen. The distribution of the mesquite may be influenced by cattle grazing and drift, as seed germination does occur after the seed has been eliminated by cattle.

Pinyon pine (Pinus monophylla) and juniper (Juniperus monosperma) form sparse stands in elevations above 4,000 to 5,000 feet. Scattered in among the stands are brush and shrubs including

wavy-leaf oak (Quercus undulata), mountain mahogany (Cercocarpus sp.), buckbrush (Ceanothus vestitus), manzanita (Arctostaphylos sp.), and cliffrose (Cowania mexicana). Big sage (Artemisia tridentata) and blacksage (Artemisia nova) are interspersed throughout, along with joint firs (Ephedra sp.) and yuccas. Cattle utilize most of these species to some extent, but nevertheless depend heavily on annual forage production.

The production of annual vegetation, as indicated above, is largely dependent on precipitation. Drought years compound the problem of a lack of annual production with a lack of available water. Most of the water in the county is supplied from springs and reservoirs. The quality and quantity of these water sources generally depends on seasonal precipitation, whether in the form of rain or snow. Generally, annual vegetative production and water availability can be considered relatively proportionate.

Virgin Valley Planning Unit

A few allotments in the Virgin Valley Planning Unit, (particularly those located on mesas) produce relatively large quantities of perennial grasses, especially galleta. In these allotments the annual production may take on the role of a supplemental forage rather than the mainstay it has become on other more ephemeral-type allotments. Upper and Lower Mormon Mesa and the Mesa Cliff allotments support several of these perennial grass areas. Utilization on these allotments is not necessarily bound to winter-spring rains, therefore, the mature standing grass has been successfully utilized in many years during the late summer/fall months.

Allotments which have major washes running through them, including White Basin, Flat Top Mesa, Pulsipher Wash, and Gold Butte, produce potentially large quantities of annuals following winter and spring precipitation. The green vegetation in the washes remains succulent long after the ephemerals on the flats and mesas have withered and died. A large percentage of the livestock and wild horses and burros in the White Basin allotment spend most of their time down in one or more of the major washes, for example, Echo Wash, which often has a small amount of water in it almost yearlong.

Cattle left on the Hen Springs, Bunkerville, Billy Goat Peak, and Gold Butte allotments past late spring or early summer may be forced to move up into the high country to take advantage of continued green growth at higher elevations. At this time, annual production on the lower elevations is usually beyond its optimum nutritional growth stage and rapidly loses its forage value. Summer leader growth on cliffrose is hard hit by the cows on the Billy Goat Peak allotment because perennial grasses are in short supply and annuals are no longer available.

The nature of the soils, location, topography, and elevation in the Dry Lake, Muddy Mountains, Arrow Canyon, Ute, Acton-Farrier, and Rox allotments gives them the potential to produce only marginal amounts of annual forage, even in wet years. Limited areas may produce adequate ephemerals for a short period, but the vegetation consists of little more than creosote-burrobush associations. Other desert shrubs are prevalent including range ratany, yuccas, mormon tea, and a scattering of grasses, usually galleta.

The Gold Butte allotment is very large and is comprised of many vegetation communities and a wide array of topographic diversities. Livestock are able to move about to different aspects and elevations as weather and forage conditions change from season to season. Much of the Billy Goat Peak allotment, however, is inaccessible due to steepness or rough terrain. Livestock movements are more confined and less variety of forage is available. The allotment has little perennial grasses, so when annuals are deficient in the summertime, perennial shrubs are heavily over-utilized.

The feasibility of administering successful land/vegetation treatments in the Virgin Valley Planning Unit is low due to low amounts of precipitation and erratic precipitation patterns, high temperatures, low elevations, and marginal soils. These climatic and geologic conditions combine to produce a massive land area with little potential for increased forage productivity, either by manipulation or natural causes.

The eastern portion of the Virgin Valley Planning Unit is fairly well watered, however, the opposite is the case for the remainder of the planning unit. Few permanent waters are available to livestock west of the Virgin River. For the most part, water is supplied on an intermittent basis through water hauls and man-made reservoirs. The quality of these waters may be low due to high rates of evaporation, stagnation, and silting in. Additionally, the distribution of the waters is inadequate to reduce heavy concentrations of livestock and wild horses and burros around water sources. More waters, and better engineering are needed to assure good water quality and dispersal of livestock and wild horses and burros (see the discussion on Livestock Management Facilities).

Apparent condition and trend classes, which were established during the 1979 range survey, show that a majority of the planning unit is in poor condition and static apparent trend. This indicates that most of the planning unit is in a stable successional stage. However, it must be noted that the studies were conducted on a singular visual observation conducted during

the range survey. All condition classes indicate only livestock forage condition, and the trend data is for apparent trend.

*** The opportunity does exist in this planning unit for the initiation of a studies program. Studies which should be started are climate, trend, condition, utilization, actual use, and phenology. The data gathered from these studies should be used to analyze the progress of the forage resource under different stocking levels and management practices. The studies would be particularly useful in charting the return of perennial forage in those areas where the potential exists for forage production to improve.

*** Because of the difficulty in determining the proper stocking rates when grazing annual forage on ephemeral and ephemeral/perennial ranges, an opportunity exists to clip plots to determine a lb/acre figure of annual forage before grazing is authorized, and to facilitate closer range supervision to determine when the annual forage dies and livestock should be removed.

Stateline Planning Unit

Allotments in the Stateline Planning Unit which have the potential for producing a good annual forage crop if climatic factors are good are Christmas Tree Pass, Newberry Mountains, McCullough Mountains, Crescent Peak, and portions of Ireteba Peak.

A limited study was made of vegetative production of ephemeral plants in the Stateline Planning Unit during the spring of 1973. Precipitation patterns for the preceding fall and winter are shown in Table .44-1. It is important to relate ephemeral production with monthly precipitation. Without information on precipitation, it is impossible to determine whether production is related to an average year.

Production in Eldorado Valley (where ephemeral plants were largely in the cover of perennial shrubs) varied from 40 to 480 pounds per acre, with an average total production from the 5 plots of 226 lb/acre. Of this total, it was considered that 158 lb/acre were edible forage. Average production of ephemerals is estimated at 10 lb/acre.

Density in Eldorado Valley varied from 8 to 14 hits per 100 feet. An average of 6 transects showed an average cover of perennial vegetation of 3.5 percent and cover of ephemeral vegetation of 6.8 percent. This area is representative of the northern portions of the McCullough Mountain and Ireteba Peak allotments.

TABLE .44-1
Stateline Planning Unit

PRECIPITATION PRECEDING 1973 EPHEMERAL PRODUCTION STUDY

	<u>Precipitation</u>								
	1972						1973		
	<u>July</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>March</u>
	(Inches)								
Las Vegas	.13	.84	.63	1.12	1.09	.19	.49	1.64	1.86
Las Vegas Average	.50	.48	.34	.30	.31	.40	.53	.44	.35
Searchlight	T	.94	.40	1.01	1.54	.41	.53	1.79	1.47
Searchlight Average	1.03	.96	.73	.51	.53	.90	.89	.86	.78

Source: BLM, Stateline Unit Resource Analysis, 1973

Production was higher in Piute Valley, where ephemeral plants grew in fairly solid stands and were not restricted to the bushes. Production varied by plot from a low of 820 lb/acre to 2,740 lb/acre. The average production of the 5 plots was 1,762 lb/acre. Of the total, 1,408 pounds were considered edible forage. Average production of ephemerals is estimated at 30 lb/acre.

Density in Piute Valley varied from 16 to 45 hits per 100 feet. Average of the 6 transects indicated cover of perennial vegetation is 4 percent and cover of ephemerals was 27.6 percent. This area is representative of the lower elevations of the Crescent Peak, McCullough Mountains, and Christmas Tree Pass allotments.

North of Pahrump a transect was run through the Black Hills. Vegetation was largely limited to bushes. Production varied by plot from a low of 200 lb/acre to a high of 810 lb/acre. Total production of the 5 plots was 522 lb/acre, with 358 lb/acre considered edible. Average production of ephemerals is estimated to be 5 to 10 lb/acre.

On this transect, density varied from 2 to 24 hits 100 per feet. Averaging all 6 transects, cover of perennial vegetation was 4.8 percent and ephemeral vegetation showed 9.5 percent cover.

Areas with annuals growing only under perennial shrubs were notably Las Vegas Valley and Las Vegas Wash (below 3,000 feet elevation), Pahrump Valley (below 3,000 feet elevation), and Eldorado Valley. These annuals were predominantly the taller flowering primroses and poppies, early in the spring. They are followed later by members of the sunflower family.

Allotments in the Stateline Planning Unit which have the potential to produce only marginal amounts of annual forage are Jean Lake, Lucky Strike, Black Butte, Table Mountain, Roach Lake, Younts Spring, Stump Spring, Wheeler Slope, Kyle Canyon, Wheeler Wash, and South Point. Hidden Valley can produce a large crop but only in a limited area.

It is difficult to make determinations as to proper stocking rate on applications for grazing use on ephemeral and ephemeral/perennial ranges. That is, how much harvesting of annual forage should be allowed over and above that perennial forage taken by the base herd on ephemeral/perennial allotments or how much annual forage should be allowed to be harvested on ephemeral allotments.

*** There is an opportunity to clip plots to determine a lb/acre figure of annual forage before stocking is allowed and to have closer range supervision to determine when the forage dries and livestock should be removed.

A critical period for the livestock operation in the Stateline Planning Unit comes after late May and June when annuals dry, especially on allotments lacking higher elevation range such as Ireteba Peaks. If summer rains come early in July, summer grasses like big galleta and black grama will green up, providing forage. In the Crescent Peak, McCullough Mountains, and Jean Lake allotments cattle move into the higher country during the summer, utilizing perennial grasses and shrubs. The important ones are needlegrass, big galleta, black grama, bentgrass (Agrostis sp.), Mormon tea, and the forb globemallow.

On the lower elevations of the Crescent Peak allotment, Mormon tea, range ratany, shrubby buckwheat, bush muhly, black grama, and big galleta were also present in cattle's diet during the winter (Burkhart, personal communication 1980).

Cattle do not use the rocky, extremely steep areas of the planning unit as a rule. However, it is not uncommon to find several head on high mountaintops in the McCullough Mountain Range during the summer months. Ten to twenty head will graze close to a spring in the mountains and forage up washes which are generally less steep and rocky than the surrounding canyon walls.

Water distribution and the location of vegetation types of large acreage which produce few forage species (perennials or annuals) are probably the two main factors determining cattle distribution in the Stateline Planning Unit. Only the Crescent Peak allotment is considered adequately serviced by water. Most of the live springs in the allotments vary in their annual production due to variable precipitation. Of the approximately 10 live springs in the McCullough Mountains allotment, for example, only 3 are considered reliable yearlong waters. For this reason little development or maintenance of the springs for livestock is done by the operators. Pipelines from springs are often buried in washes for convenience of installation. These are regularly damaged by flash flooding during heavy rainstorms. Deep wells and water hauls are viewed as the most reliable water sources and heavy grazing occurs yearlong around these sources in all allotments (see opportunities described in discussion of Management Facilities).

The Colorado River provides a permanent water source for cattle in the Ireteba Peaks, Christmas Tree Pass, Newberry Mountains, and South Point allotments; however, because of the steep terrain and lack of forage species cattle do not make substantial

use of the river. If annuals appear in the spring, livestock are hauled to the eastern side of the mountains in the Ireteba Peaks and Christmas Tree Pass allotments, and will water at the Colorado River. Only in the South Point allotment do the cattle use the river yearlong.

Thick, high brush limits distribution and management of cattle in the Wheeler Wash allotment. Therefore cattle congregate in areas where past fires have removed thick pinyon-juniper and manzanita stands. The distribution problem is compounded by waters being located in the accessible areas. Wildlife, wild horses, and cattle compete for forage and water in the burned areas. See the land treatment discussion under Grazing Administration for opportunities to improve this allotment.

Besides the large stands of manzanita and pinyon-juniper in the Wheeler Wash allotment, large unproductive (from a livestock forage standpoint) stands of blackbrush occur in almost all the allotments. This vegetation type extends above the joshua tree zone to the pinyon-juniper zone between elevations of 3,000 and 5,000 feet. See the land treatment discussion under Grazing Administration for opportunities to improve blackbrush types.

Cattle also congregate in areas where soil is more sandy relative to the surrounding areas. The Jean Lake allotment is a good example where a combination of rocky soils, steep terrain, large expanses of blackbrush, and water distribution force cattle to graze heavily on the Jean Dry Lake bed yearlong. Russian thistle has increased around the lake, big galleta has decreased in vigor, and Indian ricegrass which grows in protected areas cannot be found. Further development of this type of area should be discouraged to prevent any increase in grazing pressure, caused by water developments, for example.

Large areas of creosote-burrobush vegetation types which consistently lack good annual forage production exist in almost all the allotments. These areas do not provide cattle forage and show no opportunity for improvement through management.

The South Point, Christmas Tree Pass, Roach Lake, Table Mountain, Black Butte, Younts Spring, Stump Spring, and Kyle Canyon allotments have little potential to improve the perennial forage plants.

*** The opportunity does exist throughout the planning unit for the initiation of a studies program to analyze the progress of the forage resource under different stocking levels and management practices. The studies--climate, trend, condition, utilization, actual use, and phenology--would be particularly useful in charting the return of perennial forage on potentially

ephemeral/perennial ranges to production levels able to support a base allocation to livestock.

b. Wild Horses/Burros-Vegetation Relationships

Forage values for wild horses/burros are similar to values for cattle, and the same limitations occur. However, horses and burros are "volume eaters", consuming much more forage in relationship to body size than do cattle or sheep. Horses and burros do not have a rumen (secondary stomach in which digestion of low quality forage is aided by bacteria), as do cattle and sheep, and must absorb nutrients directly as forage passes through the digestive tract. Food efficiency conversion is slightly more than half that of cattle and sheep, according to nutrient studies by Morrison (1956).

Horses and burros also eat more of an individual plant than do cattle or sheep. Horses and burros "clip" forage plants with their teeth, and cattle and sheep "strip" a plant of forage with their tongue and upper front gum pad.

Because of their need for more forage and their ability to travel, horses and burros graze a larger area than do cattle. Most of the forage species preferred by horses/burros are perennial grasses and forbs, which are also preferred by cattle. Some palatable shrubs are relished yearlong by horses/burros. The grasses and forbs are less nutritious during the dormant period (late fall and winter) and the animals lose weight, become weaker, and more susceptible to disease.

Horses/burros use the established home range of their band yearlong and will therefore utilize essentially the same plants in the same areas yearlong, expanding the area around a water source during the winter and contracting during the heat of summer. Since forage is less palatable and nutritious during the winter, horses and burros spend more time in a larger area searching for green, growing forage.

c. Noxious and Poisonous Plants

Several species of noxious and poisonous plants can be found in the county. No losses in either planning unit due to these species have been reported; therefore, it is assumed they are not a major problem to livestock management but an occasional one. In the Stateline Planning Unit, a few domestic sheep in the Christmas Tree Pass allotment and a few burros in the Spring Mountain allotment have died over the last five years, but the causes were undetermined.

Poisonous Plants

Locoweed (Astragalus spp.) occurs throughout the county at all elevations. Several species have been identified, not all of which are poisonous. Some of these species are annuals and production may be high in the spring. The poisonous principles in locoweed, barium and selenium, are believed to impart toxicity to other forage plants nearby. Decaying roots and other plant parts, when returned to the soil, become a potential source of selenium to growing crops and forage plants. The selenium is taken up through the plants' root systems, thereby rendering them somewhat toxic.

"Locoism" may result in domestic livestock and wild horses and burros when locoweed is ingested in large quantities. The ingestion of small amounts of the plants over an extended period of time may result in a chronic form of the disease. The plants remain poisonous from the time they are green until they are dead and dry. Most animals will not eat locoweeds unless other forage is unavailable or scarce. Hence, most poisonings can be expected to occur in dry years when other palatable forage is not readily available.

The lupines, like the locoweeds, occur over most of the county and are not all poisonous. The alkaloid content of the plants is the toxic factor, however, the toxin is readily excreted by animals and is not cumulative by nature. Livestock and wild horses/burros can eat relatively large quantities of lupine with no ill effects if the toxic limit is not reached.

The seeds are especially poisonous, and most poisoning cases are attributed to eating pods with seeds. Most losses from lupines are incurred from sheep, although cattle and horses/burros are susceptible, too.

With the exception of the locoweeds, the greatest losses of cattle from poisonous plants is attributed to larkspurs (Delphinium spp.). Toxic alkaloids, especially delphinine, are the poisonous principles in larkspurs. Most cases of poisoning

in cattle occur in early spring when they graze on green plants. Sheep and horses/burros are affected by the toxin to a lesser degree than are cattle.

Halogeton was introduced into Nevada from Europe around 1935. Now naturalized and spreading, it occurs on ranges in many of the western states. Originally expected to be a valuable succulent forb early in the season on arid ranges, it was soon recognized to be highly toxic, especially to sheep. The leaves and stems of the plants contain large amounts of calcium oxalate and, when ingested in sufficient quantity, may cause death in six to eight hours. The plant remains poisonous even after drying, but is highly unpalatable except in its earliest stages. Cattle rarely consume enough halogeton to be poisoned, but heavy sheep losses have been attributed to this species in the past.

The poisonous principle in death camas (Zygadenus spp.) is the alkaloid zygadenine. These plants are among the most important of the sheep poisons, though horses and cattle are also affected by them. The seeds of the plant are highly poisonous, along with the leaves, stems, and flowers, and all retain poisonous properties even after drying. Death camas is most likely to become a problem in the foothill areas where it occurs more frequently.

Princes' plume is an indicator species which occurs on soils high in selenium compounds. The plant has the ability to absorb the nonmetallic toxic element from the soil in sufficient quantities to render it poisonous to animals. Selenium poisoning is the cause for the diseases known as "alkali disease" and "blind staggers" in cattle and horses. The chronic "alkali disease" results from ingesting small quantities of selenium over an extended time period. "Blind staggers" is the acute form resulting from ingesting large amounts of the element in a short period.

The toxic properties in horsebrush (Tetradymia spp.) are attributed to a resin-like organic substance. Cattle and horses/burros rarely eat the plant as it is somewhat unpalatable. Sheep graze the young buds and leaves in early spring ingesting the poison which is cumulative in action. The resulting occurrence is an extreme sensitivity to light (a dermatitis) followed by swelling of the head, neck, ears, eyelids, and nose. This illness is aptly referred to as "bighead" in sheep. It is most often contracted when sheep are being trailed from one area to another. Several species of horsebrush occur throughout the county.

Cattle, horses/burros, and sheep are occasionally poisoned after eating of the nightshade family (Solanaceae). Solanine, an

alkaloidal glucoside, is the poisonous principle found in the herbage and berries. Animals are usually poisoned from ingesting the new shoots and unripe berries produced in the fall.

Nightshade is generally relegated to growing in waste areas where minimal grazing is expected to occur.

Greasewood is considered a valuable winter and early spring forage source for sheep. It contains oxalates of sodium and potassium which become toxic when eaten in large quantities. Most poisonings in sheep occur in early spring when they are allowed to feed exclusively on greasewood. Little danger of poisoning is expected when it is consumed with other forage. Greasewood grows in areas with alkaline or saline soils, and may be encountered in the dry lake or playa areas in the county.

The leaves and acorns of shinnery and gambel oak have been known to poison livestock when consumed exclusive of other forage. Poisoning, caused perhaps by tannic acid produced in the leaves and acorns, usually occurs in the early spring when other feed may be scarce. When taken in combination with other forage, oak is a valuable browse species. The extreme eastern portion of the Virgin Valley Planning Unit, from Hen Springs down through Gold Butte, supports comparatively heavy stands of oak where conditions for growth are favorable. In the Stateline Planning Unit, major stands of oak are found in the Spring and LaMadre Mountains with isolated stands growing in washes and at higher elevations of other mountain ranges.

Inkweed (Suaeda spp.) is another plant which produces tannic acid in its leaves. This species favors alkaline and sandy soils and causes dysentery in animals.

Noxious Plants

Many varieties of grasses and forbs, while providing good forage in early, green stages, can cause mechanical injury to livestock and wild horses/burros when mature. The plants may possess sharp spines or awns associated with the spikelets which can easily penetrate animal hides and the soft tissues around the mouth and eyes. The resulting injuries can cause infections of the mouth, gums, tongue and about the eyes, and provide access into the hide for screwworms and fungi. The most prevalent species in the Virgin Valley Planning Unit causing mechanical injury to animals are red brome (widespread and at all elevations), needlegrasses, and three-awns. In addition to these, Russian thistle is a noxious plant of minor occurrence in the Stateline Planning Unit.

2. Condition and Trend

a. Domestic Livestock

Introduction

Range condition (livestock forage condition) refers to the quality of forage of each vegetation type for the class of livestock authorized to graze on the allotment. Information for range condition was gathered during the 1979 range survey and determined from the percent composition of desirable, intermediate, or undesirable plants in a vegetation type. Using this method for determining condition, an area may have low plant density and still be considered in good condition. An area is considered in good condition if 40 percent or more of the species composition is in the desirable and intermediate category and the soil surface factor (SSF) is below 60.

Apparent trend is a measurement of change in a plant community based on (1) the relative occurrence of desirable livestock forage plants and seedlings (usually perennial grasses) in the plant community; (2) vigor of these desirable plants; (3) presence of soil movement and of litter, and (4) presence of plant disease.

Virgin Valley Planning Unit

No trend study plots are established in the Virgin Valley Planning Unit. Therefore, all references to trend in this discussion refer to apparent trend. All condition and trend classes were determined through visual observation while conducting the range survey. The percent of acres in each condition and trend class for the planning unit is broken down in Table .44-2. Refer to Table .34-7 for a summary of the condition and apparent trend for each allotment in the Virgin Valley Planning Unit.

Stateline Planning Unit

The percent acreage of each condition and apparent trend class in the Stateline Planning Unit is shown in Table .44-3. Refer to Table .34-8 for a summary of the condition and apparent trend for each allotment.

Permanent trend plots have been established on the Crescent Peak allotment and have been read since 1974. The plots generally show no measurable changes in the vegetation composition of the key forage species because of grazing pressure, but do indicate very strongly that black grama is sensitive to climatic changes in the allotment because many plants died after the 1975 drought and those that remain have not regained vigor.

TABLE .44-2
Virgin Valley Planning Unit

LIVESTOCK FORAGE CONDITION AND TREND

<u>Condition</u>	<u>Percent of Planning Unit</u>
Good	3%
Fair	6%
Poor	91%

<u>Apparent Trend</u>	<u>Percent of Planning Unit</u>
Upward	2%
Static	95%
Downward	3%

TABLE .44-3
Stateline Planning Unit

LIVESTOCK FORAGE CONDITION AND TREND

<u>Condition</u>	<u>Percent of Total</u>
Good	3%
Fair	11%
Poor	86%

<u>Apparent Trend</u>	<u>Percent of Total Acreage</u>
Upward	2%
Static	94%
Downward	4%

Source: BLM 1979 Range Survey for Clark County.

General

A variety of factors combine to influence range condition and apparent trend, including precipitation, temperature, soil types, and present and past use. Much of the county lies in a 4-inch annual precipitation zone, and summer temperatures often rise to 120°F. This low precipitation, intense heat, and high evaporation rate affects the composition, density, and vigor of the plant species.

Soil types vary throughout the area. Soil characteristics range from shallow sandy soils to barren limestone mountains. Refer to Section .33B, Soils, for a detailed analysis of the different soil types in the county.

Some inferences can be made from the range survey data of 1979. The majority of the county is in a poor condition class with a static or unchanging trend. When interpreting this data in relation to the history of use on the allotments some questions arise. The vegetation communities in the Ireteba Peak allotment were determined to be 100 percent in poor condition with a majority in a static trend. Approximately 50 percent of the total land area in the allotment (that area known as Eldorado Valley) has not been grazed by domestic livestock for approximately 20 years. It could be assumed from this that some of the vegetation types in the county do not have a potential for establishment of desirable forage species for livestock. In fact, in most of the area in the Eldorado Valley there is apparently no seed source for perennial grasses.

Another quality brought out by the survey is the length of time it takes to measure any change in trend in the county. All allotments have types in poor condition regardless of past history of use. Three allotments with 20 years of total non-use show a small upward trend in some vegetation types. Of the total acreage of areas ungrazed by livestock for 10 years or more, only .5 percent have good condition range. Therefore, even with total protection from grazing, some areas show slow response to rest and small potential for improvement in the short term. Allotments which have had grazing pressure which still show range in good condition are Lucky Strike, Jean Lake, Hidden Valley, and McCullough Mountains. Those allotments having grazing use which still show some upward trend are Jean Lake and Ireteba Peaks.

It is impossible to draw conclusions from this, however, because the types in good condition may show a downward trend and those with good condition and upward trend may be protected from grazing for some reason, such as topography or distance from water. A further problem is the lack of information to determine

what desirable forage species should be present in a vegetation type.

Existing Habitat Problems

The habitat problems for the Virgin Valley Planning Unit are low forage production and the unpredictable climatic conditions in this area. These problems make intensive management difficult.

Vegetation types in this area do not produce a high amount of desirable forage. Even range which is considered in good condition will not produce an abundant amount of forage. Most of the desirable and usable forage comes as annual production after favorable climatic conditions occur.

Low forage production and unpredictable climatic conditions are also problems making intensive management difficult in the Stateline Planning Unit. This area is also subject to extreme droughts. However, within the planning unit, average annual precipitation varies from 4 inches in Las Vegas to 7 inches in Searchlight. The higher elevations in the Spring Mountains probably receive about 10 inches on the average. Generally, there is more potential for improvement of perennials in the allotments near Searchlight and the Spring Mountains. Success of intensive management would however be quite low and changes in trend of the plant communities very slow.

b. Wild Horses/Burros

Horses and burros are a contributing cause to lower condition classes and downward trend in areas adjacent to watering sources within their use areas. The horses/burros found in Clark County seldom migrate outside of their present use areas (home range) unless forced to do so by human encroachment on the habitat or by lack of forage in the present "home range" (personal observation by District resource specialists). As forage plants decrease under grazing, the remaining plants are grazed more heavily, thus causing further deterioration of the forage resource.

3. Ecologically Unique Areas

Refer to the Range Vegetation Types Overlay in URA II.

An ecologically unique area in the Virgin Valley Planning Unit is represented by the Douglas fir and endemic plants located in the Virgin Mountains. This area is discussed in the Forest Products portion of the URA (Section .43)

Ecologically unique areas in the Stateline Planning Unit include the north end of Crescent Peak allotment and the south end of

McCullough Mountains allotment. This is a beautiful stand of Joshua trees, most of which are 15 to 20 feet tall, of the variety jaegeriana.

The Pine Creek area was designated as a natural area, with botanical values being one of the most important justifications. Several endemic plants occur here, the most notable being ferns. See Section .47A, Recreation, for more information on the Pine Creek Natural Area.

4. Grazing Administration - Domestic Livestock

a. Virgin Valley Planning Unit

(1) Nature of Base

All the grazing units in the Virgin Valley Planning Unit are land base, except for the Gold Butte Unit which is water base. The class of livestock and base requirements for each allotment are indicated on Table .44-4, Present Allotment Production and Use.

Ephemeral range classification in this planning unit allows the range to remain open to grazing at any time of the year that forage is available.

Livestock carrying capacity will change each year with the variation of forage production. Because of this variation in carrying capacity, most of the operators use federal range only as a supplement to their base operation. However, there are a few operators who use the range year-round. Normal use in this area occurs during the spring and fall.

(2) Historical Use

The Virgin Valley Planning Unit was originally part of the Searchlight Grazing District. Allotment boundaries were established after the Taylor Grazing Act in 1938. Most allotment boundaries were set by rangeline agreements.

Before the ephemeral classification was established, livestock grazing occurred year-round. Livestock were allowed to graze freely throughout the area, because all of southern Nevada was open range.

After establishment of the Grazing District, grazing operations remained the same as before, until 1969 when the ephemeral classification was established.

TABLE .44-4
Virgin Valley Planning Unit

PRESENT ALLOTMENT PRODUCTION AND USE

Allotment ADP # *1	Allotment	Acres	Average Ephemeral Licensed Use 1975-1979 *2 (AUMs)	Operators	Type Base *3	Period of Use *4	Kind of Livestock*4	Suitable Perennial Production (AUMs)	Potentially Suitable Perennial Production*5 (AUMs)	Water Used @ 300 gal/ AUM *6 (1,000 gal)
2001	Acton-Farrier	45,536	53	C.A. Lewis	Land	Mar-May Sept-Nov	Cattle	0	0	16
2002	Arrow Canyon	101,698	304	G.M. Perkins	Land	Mar-May Sept-Nov	Cattle	49	0	91.2
2003	Azure Ridge*7	6,914	Unknown					0	0	
2004	Billy Goat Peak	49,133	1,397	Keith Nay	Water	Yearlong	Cattle	291	0	419
2005	Bunkerville	139,639	304 C 13 H 428 S	Melburn Jensen Calvin Adams Cliven Bundy Kerry Woods <i>Arrowhead cattle camp</i> Roland Esplin	Land		Dual-use Sheep, Cattle, Horse	0	31	91 C 4 H 25.7 S
2007	Dry Lake	69,399	199	J. Hendricks	Land	Mar-May	Cattle	62	47	59.7
2008	Flat Top Mesa	5,338	44 C 4 H	Harold Wittwer	Land	Mar-May Sept-Nov	Horse, Cattle	0	0	13.2 C 1.2 H
2009	Glendale	22,353	0	C. Hester	Land	No Use	Cattle	0	0	0
2010	Gold Butte	172,549	2,730	Warm Springs Ranch	Water	Yearlong	Cattle	0	0	819
2011	Hen Springs	22,756	867	Melburn Jensen	Land	Mar-May Sept-Jan	Cattle	0	0	260
2006	Jack Rabbit	4,414	204	Larry Hardy Leo Hardy W. Pulsipher	Land	Mar-May Sept-Nov	Cattle	0	0	61.2

TABLE .44-4(continued)
Virgin Valley Planning Unit

PRESENT ALLOTMENT PRODUCTION AND USE

Allotment ADP # *1	Allotment	Acres	Average Ephemeral Licensed Use 1975-1979 *2 (AUMs)	Operators	Type Base *3	Period of Use *4	Kind of Livestock*4	Suitable Perennial Production (AUMs)	Potentially Suitable Perennial Production*5 (AUMs)	Water Used @ 300 gal/ AUM *6 (1,000 gal)
2012	Lime Spring	2,384	189	Don Frehner	Water	Mar-May	Cattle	0	0	56.7
2013	Lower Monmon Mesa	43,640	498 C 114 H	Warm Springs Ranch <i>Donald S. Whitney 6/87</i>	Land	Mar-May	Horse,	189	0	149.4 C
2014	Mesa Cliff	14,072	134 C 5 H	Jim & Jerry Haworth	Land	Sept-Nov Mar-May	Cattle Horse, Cattle	0	128	34.2 H 40.2 C 1.5 H
2015	Mesquite Community *7	13,106	0	Dan Frehner	Land	No Use	Cattle	0	0	0
2016	Muddy Mountains	243,170	154 C 53 H	W. J. Clough K. Searles	Land	Mar-May	Horse, Cattle	0	0	46.2 C 16 H
2017	Muddy River	20,081	0	Paul C. Lewis	Land	No Use	Cattle	0	0	0
2018	Overton Arm	5,221	0	Paul C. Lewis	Land	No Use	Cattle	0	0	0
2019	Pittman Well	39,595	0	K. Searles	Land	No Use	Cattle	118	0	0
2020	Pulsipher Wash	3,230	90	Bryan Hafen	Land	Mar-May Sept-Nov	Cattle	0	0	27
2021	Rox	21,736	0	Moapa Band of Paiutes	Land	No Use	Cattle	0	0	0
2022	Sunrise Mountain	34,272	-	Unallotted	Land	No Use	-	0	0	0

TABLE .44-4 (continued)
Virgin Valley Planning Unit

PRESENT ALLOTMENT PRODUCTION AND USE

Allotment ADP # *1	Allotment	Acres	Average Ephemeral Licensed Use 1975-1979 *2 (AUMs)	Operators	Type Base *3	Period of Use *4	Kind of Livestock*4	Suitable Perennial Production (AUMs)	Potentially Suitable Perennial Production*5 (AUMs)	Water Used @ 300 gal/ AUM *6 (1,000 gal)
2023	Toquop Sheep	29,793	393	E. Larson Roy Lundgren Donald Lamoreau Larso & Anderson	Land	Mar-May	Sheep	0	58	117.9
2024	Upper Mormon Mesa	47,659	742 C 37 H	Foremaster Foremaster Bros Paul Lewis	Land	Mar-May Sept-Nov	Horse Cattle	320	0	222.6 C 11.1 H
2025	Ute	70,280	107*8	G. Perkins K. Searles J. Hendricks	Land	Mar-May	Cattle	0	0	32.1
2026	White Basin	171,360	997	E. Leavitt L. Leavitt	Land	Mar-May Sept-Nov	Cattle	174	180	299.1
Total		1,399,328	10,060					1,203	444	2,915.2

*1 ADP numbers are computer identification numbers used in the range survey to identify allotments.

*2 Allotments were classified ephemeral since 1969, numbers fluctuated so average was used.

*3 Ownership of base (water or land) on ephemeral range is not commensurate to any assigned grazing privileges. Base entitles a range user to the privilege of applying for grazing use on ephemeral range.

*4 These are not formally designated, categories portray use over last five years.

*5 Suitable range outside of base water service areas.

*6 Average past use over last five years.

*7 Administered by Arizona Strip District, no data available

*8 1 year use, 4 years no use

Currently only two allotments (Billy Goat Peak and Gold Butte) are used for what becomes, in practice, year-round grazing. The remaining allotments are used for grazing permits ranging from three months to six months, depending on forage availability. Most of the range users keep herds on their private land and turn out livestock when forage is available.

It has been the practice of some range users to abandon those livestock which could not be gathered easily, while some livestock have simply been left on federal range yearlong. Because of this situation, there is an estimated 20 to 30 head of cattle wandering among the Bunkerville, Hen Springs, Billy Goat Peak, and Mesquite Community allotments, and an estimated 2 to 5 head of cattle on the Arrow Canyon Range and Acton-Farrier allotments. These cattle have been roaming the area for so long that they can now be considered "wild cattle." There is a fair amount of damage to the resource attributable to these animals.

*** An opportunity exists to remove these cattle to eliminate one source of yearlong grazing pressure on the range.

(3) Kind of Livestock

All allotments in the planning unit except two are classified for cattle and horses. The Toquop Sheep allotment is grazed solely by sheep. The Bunkerville allotment is classified for dual use.

On five allotments, domestic horses are usually licensed: Billy Goat Peak, Gold Butte, Upper Mormon Mesa, White Basin, and Arrow Canyon. In all cases these animals are incidental to the livestock operation rather than being part of a separate horse operation. The operators find it convenient to leave the horses in place and license them rather than haul them back and forth between the ranch and the allotment.

There are wild burros found on the Gold Butte allotment and there may be a small wild horse herd on the White Basin allotment. In neither case, however, does there appear to be either interaction or conflict between the domestic and wild animals.

A sheep use and trailing area are delineated on the Grazing Administration Overlay. The only trailing at this time is by sheep operators. All trailing occurs in the spring when the sheep operators bring their sheep north after wintering them in Utah or the Arizona Strip. The sheep are trailed through the Gold Butte, Billy Goat Peak, and Bunkerville allotments, to their final destination on the Toquop Sheep allotment. The sheep are kept there for lambing, then moved off the range and back to private land in Utah.

(4) Allotment Management Plans

There are no allotment management plans (AMPs) in this planning unit. Given the existing ephemeral nature of the range, full AMPs would probably not be cost-efficient at this time. However, several allotments which are potentially ephemeral/perennial have perennial forage present that might be brought to suitable production levels through the use of grazing systems that could allow a base allocation of forage.

*** An opportunity exists to reclassify the allotments listed in Table .44-6 as ephemeral/perennial, and to develop grazing systems through the Coordinated Resource and Management Planning (CRMP) process.

(5) Management Facilities

There are relatively few management facilities in the Virgin Valley Planning Unit because the low carrying capacity does not justify large capital expenditures. Natural barriers are used wherever possible.

Fences, cattleguards, and corrals are used to manage livestock use by restricting their movement. These structures cause heavier grazing and trampling by restricting livestock to a certain area, but also deny access to and protect other areas. Waters are essential to livestock, but the heavier grazing use in the areas around water limit vegetative production on these areas.

Dependable water is derived from springs and wells which are properly developed and equipped. Reservoirs are not dependable because of frequent prolonged drought and the high silt-load of the runoff water that fills them. Snow is seldom available, except during later winter on the highest mountains. The difficulty of obtaining and distributing water economically is preeminent.

*** An opportunity exists to improve livestock waters in the planning unit by completing maintenance on developments which have become rundown (See Table .35-23 in URA 2).

(6) Conflicts

There are a variety of conflicts in this planning unit. Conflicts occur between livestock, wildlife, wild horses and burros, predators, and off-road vehicles. Conflicts also exist between livestock operators concerning allotment boundaries, use areas, and project maintenance.

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Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

Big game species in this planning unit are mule deer, bighorn sheep, and mountain lion. There are minimal conflicts between mule deer, mountain lion, and livestock. Most conflicts occur in areas near water, however, wildlife can travel farther from water than livestock, which reduces competition. For a detailed analysis see Section .46, Wildlife.

Burros present a problem to livestock because of their uncontrolled use of forage and water. Burro populations have been growing steadily each year, causing increased competition for forage and water. See the separate discussions of wild horses and burros in this section for more information.

Off-road vehicles (ORVs) present a number of conflicts with livestock grazing. Uncontrolled use by individuals in ORVs causes the problems. Livestock operators have reported fences cut, water developments destroyed, and harassment and death of livestock. Competitive events by organized groups who work with the BLM cause minimal conflicts with livestock. Since these events are scheduled in advance range users can move livestock out of the event area. Some conflicts may occur if resources are damaged by the vehicles. Most of the damage during competitive events is caused by spectators. Although spectator areas are designated, spectator use is difficult to control.

The problem of predation, especially by coyotes, is one which must be addressed and confronted by all range users. Predator control, currently practiced in the Bunkerville allotment, has been requested by the sheep ranchers in the Toquop allotment. While it is generally acknowledged that sheep ranchers lose a few head to predators, the extent of loss can be controlled to some degree by the quality of band management. More intensive management substantially decreases losses to predation. As yet, an extensive predator inventory has not been conducted for the Virgin Valley Planning Unit, therefore, it is difficult to assess the damage actually attributable to predation.

Because of differences in management concepts, operators in community allotments often have difficulty reaching cooperative agreements. They also fail to adhere to the responsibilities of existing agreements. For these reasons many projects have been allowed to deteriorate and are currently unusable.

(7) Range Suitability

Unsuitable range shown on Table .44-5 indicates those acres which are steep, rough, and have rock outcrops which cannot be used by the class of livestock authorized to graze on a specific allotment. Other areas which may be classified as unsuitable are the vegetation types producing less than 25 pounds of perennial forage per acre.

TABLE .44-5
Virgin Valley Planning Unit

SUITABILITY CLASSES BY ALLOTMENT

Allotment ADP #	Allotment	Acres Suitable Perennial	Acres*1 Potentially Suitable Perennial	Total*2 Perennial Acres	Acres*2 Unsuitable Low Production Below 3,200' Elevation	Acres*2 Unsuitable Low Production Above 3,200' Elevation	Acres Unsuitable Due to Slope >50%	Acres Unsuitable Due to SSF >60	Acres Unsuitable Because of Rock	Total Allotment Acres
2001	Acton-Farrier	0	0	0	44,471	0	1,065	0	0	45,536
2002	Arrow Canyon	1,301	0	1,301	86,144	8,103	6,150	0	0	101,698
2003	Azure Ridge	0	0	0	0	0	0	6,914	0	6,914
2004	Billy Goat Peak	1,719	0	1,719	26,526	14,017	5,982	45	844	49,133
2005	Bunkerville	0	1,073	1,073	110,249	10,435	4,127	10,622	3,133	139,639
2006	Jack Rabbit	0	0	0	0	0	0	4,414	0	4,414
2007	Dry Lake	1,748	1,330	3,078	55,491	5,959	4,871	0	0	69,399
2008	Flat Top Mesa	0	0	0	3,170	0	259	1,909	0	5,338
2009	Glendale	0	0	0	22,078	0	163	0	112	22,353
2010	Gold Butte	0	0	0	70,139	79,699	11,494	11,155	62	172,549
2011	Hen Springs	0	0	0	13,573	3,471	5,044	0	668	22,756
2012	Lime Springs	0	0	0	0	1,667	717	0	0	2,384
2013	Lower Mormon Mesa	3,953	0	3,953	39,590	0	97	0	0	43,640
2014	Mesa Cliff	0	4,304	4,304	3,591	0	64	6,113	0	14,072
2015	Mesquite Community	0	0	0	3,606	7,658	1,842	0	0	13,106
2016	Muddy Mountains	0	0	0	196,916	5,775	14,993	25,115	371	243,170
2017	Muddy River	0	0	0	18,457	0	1,176	0	448	20,081
2018	Overton Arm	0	0	0	4,299	0	198	724	0	5,221
2019	Pittman Well	1,729	5	1,734	27,272	7,448	3,141	0	0	39,595
2020	Pulsipher Wash	0	0	0	0	0	245	2,985	0	3,230
2021	Rox	0	0	0	21,256	0	480	0	0	21,736
2022	Sunrise Mountain	0	0	0	21,905	951	2,833	8,454	129	34,272

TABLE .44-5(continued)
Virgin Valley Planning Unit

SUITABILITY CLASSES BY ALLOTMENT

Allotment ADP #	Allotment	Acres Suitable Perennial	Acres*1 Potentially Suitable Perennial	Total*2 Perennial Acres	Acres*2 Unsuitable Low Production Below 3,200' Elevation	Acres*2 Unsuitable Low Production Above 3,200' Elevation	Acres Unsuitable Due to Slope >50%	Acres Unsuitable Due to SSF >60	Acres Unsuitable Because of Rock	Total Allotment Acres
2023	Toquop Sheep	12	1,521	1,533	27,652	0	366	242	0	29,793
2024	Upper Mormon Mesa	5,991	0	5,991	39,469	0	1,221	0	978	47,659
2025	Ute	0	0	0	63,563	4,537	64	2,116	0	70,280
2026	White Basin	2,254	2,256	4,510	88,518	19,717	7,166	50,939	510	171,360
Subtotal*3		18,707	10,489	29,196	987,935	169,437	73,758	131,747	7,225	1,399,328
9999	Unallotted	0	0	0	71,903	0	9,296	25,455	0	106,654
Subtotal*4		0	0	0	71,903	0	9,296	25,455	0	106,654
Total		18,707	10,489	29,196	1,059,838	169,437	83,054	157,202	7,255	1,505,982 *

*1 Acres of vegetation types producing 25 lb/acre of perennial forage or better outside of a 4-mile radius of water

*2 Ephemeral forage may be licensed for livestock grazing in all of these vegetation types when produced, if serviced by water during the period of use

*3 Allotments having base property owned by livestock operators

*4 Areas never allotted

*5 Total allotment acres for the planning unit does not equal total BLM administered acres, because other agency lands and private lands are included within some allotments

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The major cause of range unsuitability in the Virgin Valley Planning Unit is the lack of perennial forage. Most of the planning unit is classified as ephemeral range because it produces less than 25 lb/acre of perennial forage but has the potential to produce ephemeral forage.

*** The opportunity exists to license livestock grazing on annual forage on both ephemeral and ephemeral/perennial ranges when such forage is present.

*** The opportunity exists to convert the classification of eight allotments from strictly ephemeral use to combined ephemeral/perennial use. Four of these allotments, identified in Table .44-6, were found to meet the necessary requirements to warrant a change in classification. The period of use on these allotments could reasonably be set to run in the period from November 1 through February 28. Grazing during this period of the year would be least harmful to perennial plants, and would coincide with winter precipitation patterns for the valley. Winter

precipitation precedes the annual resurgence of ephemeral production on which ephemeral licensing is based. In addition, four other allotments with no presently existing perennial forage have the potential under proper management to produce perennial forage. Should the classifications change from ephemeral to ephemeral/perennial, management systems should be developed to avoid adversely affecting the perennial vegetation when ephemeral use is authorized.

*** Since a range survey is a snapshot in time of range forage, the opportunity exists through studies and monitoring to establish proper long-term stocking levels on ephemeral/perennial ranges.

(8) General Problems

A dispute currently exists between the range users on the Bunkerville and Toquop Sheep allotments. Because of this dispute, sheep have been seen three miles south of Interstate 15. This area is in the Bunkerville allotment and the sheep are in trespass. The disagreement over the boundary line has led to extensive arguments between the range users and animosity toward the BLM.

Old rangeline agreements place the southern boundary of the Toquop allotment at the Old Highway 93. The Bunkerville cattle ranchers maintain an agreement was made to alter the boundary to the new Interstate 15 upon its completion. No fenceline exists on the Old Highway 93, and the sheep ranchers have allowed their

TABLE .44-6
Virgin Valley Planning Unit
OPPORTUNITIES FOR EPHEMERAL/PERENNIAL CLASSIFICATION

Allotment Name	Avg AUMs Use (5 yr avg)	Class	Suitable Perennial (Acres)	(AUMs)*
Lower Mormon Mesa	498	C	3,953	189
	114	H		
Pittman Well**	0		1,729	118
Upper Mormon Mesa	742	C	5,991	320
	37	H		
Billy Goat Peak	1,397	C	1,719	291
Gold Butte	2,730	C	0	0
Bunkerville	304	C	0	0
	13	H		
	428	S		
White Basin	997	C	0	0
Muddy Mountain	154	C	0	0
	53	H		

C-Cattle H-Horses S-Sheep

*Data taken from 1979 Range Survey

**Although the range survey shows a potential to reclassify the Pittman Well allotment, this allotment has been withdrawn from grazing for as long as the withdrawal is in effect, and cannot be reclassified at this time.

flocks to graze on the southern side of the road. Although technically in trespass (regardless of the disputed line), no administrative action was taken against the sheep ranchers. The cattle operators voiced several complaints on this issue, charging the sheep ranchers with deliberate trespass.

*** A reasonable solution to this problem would be to restrict sheep use to north of Interstate 15 which is an existing barrier.

A great deal of friction exists between some of the operators in the Bunkerville allotment. This friction has created two factions among the operators.

*** It is generally agreed among all the users that a reasonable solution is to create an individual use area for one of the operators. This use area could conceivably be next to his adjacent allotment, Hen Springs. It would probably be advisable to fence the division line to eliminate potential crossing over problems. Adopting this solution may, however, create the problem of showing preferential treatment to one operator in the community allotment.

A conflict also exists between the range users on the Upper Mormon Mesa allotment over responsibility for filling a 10,000-gallon water tank located in the southern part of the allotment. A cooperative agreement between the range users states that water will be hauled to the tank by both operators. Because of a failure to fill the tank, livestock have been left on the range for as long as five days without water. Livestock have been found in an extremely dehydrated condition. This situation is destructive to livestock and the range resources.

*** This problem could be alleviated by constructing a division fence to separate use areas. Water facilities would have to be provided for both areas, however, the maintenance and condition of the facility would then become the responsibility of the individual ranchers.

(9) Livestock Management Facilities

The users in the White Basin allotment have expressed the desire to graze portions of their allotment near the town of Overton.

- *** A short section of fence (one to two miles) and the necessary cattleguards could be constructed on the western perimeter of Overton to prevent livestock drift.

There is an additional problem on this allotment of excessive numbers of wild burros, reportedly exceeding 100 head.

- *** Removal or a reduction of these burros would prevent overgrazing and trampling of the range resource.

The problem of uneven distribution or a lack of waters in the planning unit should be dealt with on an individual basis as the need presents itself. New ideas and technology should be examined for practical application in constructing or maintaining water developments. Advanced techniques for constructing and sealing reservoirs can reduce the rates of silting in and vegetative regrowth while improving water quality. New designs in pumps and windmills should be investigated to determine their efficiency as compared to the standardized equipment used in past years.

- *** Specific needs have been identified by operators to drill a well in the Upper Mormon Mesa and Flat Top Mesa allotments. Both allotments are in need of a dependable permanent water source.

A large portion of the Bunkerville allotment, though used in common by five operators, remains ungrazed due to uneven water distribution.

- *** With appropriate water development, the allotment is of sufficient land area to provide the opportunity to enact a simplified rest-rotation pasture system. The allotment can be easily divided into three pastures, one north and west of the Virgin River (a natural barrier), and the other two pastures using the Gold Butte road for a division line. One of two options or a combination of both could be used to divide the lower two pastures: construction of fenceline along the Gold Butte road, or the strategic placement of waters in the southern portion to discourage northward drift. Historically, grazing use on the allotment is not excessive, thus it is feasible to utilize one pasture per year allowing a two-year rest for the ungrazed pastures. This would benefit not only the range resource, but would enable the range manager and operators to maintain closer control of livestock by virtue of managing a smaller land area.

*** The need to construct corrals at Rabbit Spring and South Well was identified by a range user in the Bunkerville allotment. Opportunities to develop these kinds of management facilities obviously exist, however, development is dependent on first having needs identified by operators.

There are numerous range improvement projects which have been allowed to deteriorate to an unusable condition. For a list of projects and their condition see Table .39-1. These projects need to be evaluated on an individual basis to determine if maintenance is needed.

b. Stateline Planning Unit

(1) Nature of Base

All allotments in the Stateline Planning Unit are water base with the exception of the Wheeler Wash allotment which is land base.

Base property is property (land or water) used to support the livestock for which a privilege to graze is sought on allotments classified ephemeral range. A grazing preference is not set, however, ownership of base determines the privilege to graze on a particular allotment. Historically, land base was private property in crop production upon which a cattle operation was fed and the privileges that were sought were to graze cattle on federal range when these crop lands were not in production.

The planning unit was established water base because, with the exception of the Wheeler Wash allotment, no agricultural crop producing ranch existed in the planning unit. This is still the case and operators are 100 percent dependent on federal range for their operation.

Though no District Manager's decision exists in the records, the District Advisory Board in 1944 required that base waters must be recognized by a State of Nevada Certificate of Appropriation.

Advisory Board records indicate that the process of recognizing ownership of water lasted through the 1940s. In January of 1953 an effort was made to attach grazing privileges to these base waters on what are now the Ireteba Peaks, Hidden Valley, McCullough Mountain, Christmas Tree Pass, Newberry Mountains, Jean Lake, South Point, and Crescent Peak allotments. The forage carrying capacity within a 5-mile radius of the base waters was the recognized grazing privilege for an allotment, provided the water was adequate, accessible and available for the maximum service area (Magleby 1959).

On the 1953 maps and tables still in BLM records, waters which were described as Class I base were those which either had proof of ownership, i.e., Nevada State Certificate of Appropriation, or were recognized as waters without appropriation but those which the operator had a "vested" interest in with no conflicting uses during the period from June 28, 1929, through June 28, 1934. Class II base waters were those that were certified or vested after this period. Though the tables and maps exist, there is no evidence of a District Manager's decision designating Class I and Class II waters and setting grazing privileges for those base waters for these allotments. Tables from 1953 do not exist for the Table Mountain, Roach Lake, Lucky Strike, Kyle Canyon, Younts Spring, and Stump Springs allotments. It appears that an evaluation of base waters did not occur on these allotments.

It is not known whether the commensurability of base waters was checked from the period of 1953 to 1969. Desert Term Grazing Permits (see Historical Use) were issued during this period and perhaps the availability of these specific bases for livestock use was not necessary as long as any adequate water sources were available during the period applied for.

In 1969, the planning unit was classified as Ephemeral Range. Since this time the commensurability, or the ability of the original base property to provide water to livestock, has not been checked in the field. Presently, there are adequate water developments available to water the licensed number of livestock in the Stateline Planning Unit though some improvements are in poor condition or in trespass.

A significant problem arose at the time of the Clark County Range Survey in 1979. The District Manager's policy (Boyles 1979) for recognizing service areas (a 4-mile radius around producing water sources) in water base allotments of Clark County was to recognize only those waters "which have been offered as base or from which pipelines extend off the offered base." Determining "offered base" was difficult because (1) records of "offered base" were scattered in the files, (2) production and availability of original base had not been enforced for the 10 years following the ephemeral range designation. Many of the waters which were recognized as base waters in 1953 are no longer producing or the range improvements have been abandoned. (3) Some of the waters recognized by BLM as base in 1953 never had a certificate of appropriation filed with the state as required. Therefore, there are very few suitable waters with a certificate of appropriation from the State which still are available for livestock use. Under the direction of the District Manager's memo, carrying capacities would now have to be recognized in service areas around offered base waters.

It was felt that to contact the operators and suggest reoffering waters as base in some cases would cause them to file with the state for a certificate of appropriations, which BLM would in turn have to protest in accordance with present BLM water policy. Therefore the following policy for recognizing offered base waters was established for the Clark County Range Survey.

Where available, tables developed in 1953 were used to identify BLM recognized base waters. For allotments which did not have tables available, other records were used (see allotment files). Class I and II waters were not differentiated. All waters were recognized as base. Field checks were done on these waters and only those sources producing water were recognized as suitable.

The following waters were not recognized under the present base water criteria (see Range Suitability Overlay). All developments are maintained and used.

*** There is an opportunity to recognize the following waters as servicing those allotments recommended for reclassification as ephemeral/perennial. Areas that would be serviced will change potentially suitable vegetation types to suitable if these waters are recognized. See Table .44-7 for a summary of the additional AUMs that would become suitable.

Ireteba Peaks

The following developments are not permitted but are used:

Water Haul	T.27S., R.63E., Sec.11, SE1/4
Water Haul	T.27S., R.63E., Sec.26, SE1/4
Water Haul	T.26S., R.63E., Sec.33, NE1/4

The following is located on private land:

Tom Curly Well T.28S., R.63E., Sec.23, NW1/4

The following is authorized under permit with BLM:

Project #4275 Desert Queen Well T.26S., R.63E.,
Sec.13, SW1/4

Hidden Valley

Cox Well, (T.25S R.61E. Sec.6 NE 1/4), was not recognized because water is not available for cattle at the source. However, the well is a good producing well, equipped with an electric pump and a large storage tank. The operator hauls water from the well to portable troughs located at T.24S., R.61E., Sec. 21, NW1/4. The service area for Cox Well is considered to be around this water haul.

McCullough Mountain

The following developments are not permitted but are used:

Searchlight Townsite Water T.28S., R.63E., Sec.22, S1/2
Supply Pipeline & Trough

Cow Well Water Haul T.27S., R.62E., Sec.36, SW1/4

The following development is permitted with BLM:

Project #4350 Highland Water Tank T.28S., R.63E.,
Sec.29, NE1/4

Jean Lake

The following is not permitted but is used:

Scotts Well Spring T.28S., R.60E., Sec. 1, SE1/4

The following is permitted by BLM in California and is used in
conjunction with the Jean Lake Allotment in Nevada:

Desert Well T.16N., R.15E., Sec.12, SE1/4 California

TABLE .44-7
Stateline Planning Unit

SUITABILITY DEPENDENT ON WATER RECOGNITION*

<u>Allotment</u>	<u>AUMs</u>
Ireteba Peak	345
Hidden Valley	415
McCullough Mountain	184
Jean Lake	148
Total	<u>1,092</u>

*Waters presently used in livestock operations but not meeting
the base water criteria set for the 1979 range survey.

The land base requirement for the Wheeler Wash allotment was the
same set for the whole district by the District Grazing Advisory
Board on February 8, 1944:

"If land is recognized as base, stock licensed from this base
must be confined to the base property for a minimum of 10% of the
time for which stock are licensed or permitted on the land base."

It appears that a substantial part of the base land for the
Wheeler Wash allotment has been subdivided in the Pahrump Valley.

*** There is an opportunity to evaluate the discrepancy and make
appropriate adjustments, if warranted.

(2) Kind of Livestock

Kinds of livestock were not set through adjudication and the 1969
ephemeral classification did not specify kind of livestock.

*** There is an opportunity to set class of livestock to cattle

and to allow domestic sheep use during years of good ephemeral forage production on allotments where it does not pose a problem to bighorn. Present horse use allotments should be allowed to remain as long as no conflict with wild horse and burro management occurs.

Permits for sheep use for one to three months have been authorized in the Christmas Tree Pass and McCullough Mountain allotments during years of good winter annual production. (The 1980 grazing season was the first season to see domestic sheep use in the McCullough Mountain allotment). The present cattle permittee applies for sheep use, although the owner of the sheep is a California operator. It has been BLM policy to license this use as long as forage is available and the permittee of records provides control over the livestock.

The National Park Service is the agency responsible for bighorn sheep management on that portion of the Christmas Tree Pass allotment within the Lake Mead National Recreation Area. The agency is not concerned about domestic sheep grazing at present as long as they are kept under control and out of the Newberry Mountains (Burke and McLean, personal communication 1980).

During the 1979 and 1980 grazing seasons domestic sheep loss occurred and sheep from the licensed band were found near Hoover Dam. The licensing of sheep in this area must be evaluated carefully. Perhaps problems could be solved if closer use supervision was begun by BLM personnel.

Until BLM receives a formal protest from the Nevada Division of Wildlife on domestic sheep licensing (because of the dangers of transmitting disease to bighorn sheep) it should be continued with stipulations and strict use supervision by BLM personnel. If personnel are not available for supervision, permits for domestic sheep use should not be issued.

The Lucky Strike and Younts Spring allotments are currently authorized for domestic horse grazing. There is no conflict with wild horses on the Younts Spring allotment. However, the presence of wild horses on the Lucky Strike allotment offers potential conflict with the domestic horses now licensed to graze there. (Unbranded and/or unclaimed horses were present on the allotment at the time the Wild Horse and Burro Act passed in 1971). A stipulation on the license states that the operator contact BLM when he plans a roundup. This should be strictly enforced. At the present time, BLM policy prohibits the licensing of domestic horses in areas where wild horses are known to occur.

*** There is an opportunity to remove wild horses from this allotment.

(3) Historical Use

Past history of livestock grazing in the Stateline Planning Unit is poorly documented. Prior to 1900, a large cattle operation known as the Rock Springs Land and Cattle Company grazed over all of southern Nevada and the eastern part of San Bernardino County, California. Soon after 1900 the operation was confined to California and other cattle operators moved into Nevada. The area became part of the Searchlight Grazing District in 1938. From 1938 to 1953 the task of implementing the Taylor Grazing Act was carried out. Many operators ran livestock in common during this period. The District Advisory Board, together with the Grazing Service, held numerous meetings to establish which operators had priority rights and to work out rangeline agreements. The allotment boundaries recognized today were established through these agreements, which were finalized from June, 1953, through March, 1954.

During 1953 an adjudication attempt was made. Little evidence of a range survey exists. Demand of base property, Class I and Class II, was tabulated, however this adjudication process was either not finalized in a decision, or the adjudication did not change stocking rates or seasons of use.

Although BLM records state that "the Searchlight grazing unit was adjudicated by agreement on January 1, 1953" (Magleby 1959) no change of use occurred (i.e., livestock numbers, seasons, etc.) from that which was occurring prior to 1953 (Weikel, personal communication, 1980).

For many years through the 1950s up to 1965, licensing was by desert term permit. In order to issue desert term permits grazing units were classified as annual desert range though no written justification was submitted nor was approval received from either the Regional Office or the Washington Office at the time. Licensed use was applied for annually and granted. This apparently never exceeded what was recognized in the adjudication attempt of 1953. Though no adjudication decisions can be found, apparently the district recognized privileges because it issued non-use for the amount of AUMs not applied for under desert term permits.

A formal recommendation from the Nevada State Director to the Director of BLM for the annual desert range designation came in 1965, but no action took place. Clark County was classified as ephemeral range on November 12, 1969 effective March 1, 1970. (See Federal Register, Vol. 33, No. 238 dated December 7, 1969, page 18245 for enabling authority.)

This designation was an adjudication setting the season of use to "when forage is available." There is no set carrying capacity, and numbers vary with the amount of forage available. Under this designation, a decision has to be made by the authorizing office upon application as to whether to allow grazing. In a true ephemeral type it is unlikely that base year-round herds would exist since perennial forage would be scarce. This is not the case in the Stateline Planning Unit.

The McCullough Mountain, Crescent Peak, Ireteba Peak, Christmas Tree Pass, Roach Lake, and Wheeler Wash allotments have sustained yearlong cattle use for the last 42 years.

Cow-calf operations have emerged totally dependent on the federal range. The Crescent Peak allotment runs approximately 400 cows yearlong. An average of 20,796 AUMs have been used each year for the last 5 years in the entire Planning Unit. The ephemeral "adjudication" did not change the status quo.

During the Phase I watershed inventory of 1972, vegetation writeups approximating a range survey were made. Carrying capacities were computed from the watershed writeups. These carrying capacities are available in the 1973 Stateline URA, but were never used in an adjudication process. Perhaps their only use was to balance AUMs in the Crescent Peak AMP. Records are scattered or lacking.

A weight estimate range survey was conducted for Clark County in the spring of 1979. The suitable and potentially suitable AUMs derived from the survey are shown in Table .44-8. The survey shows 6,557 AUMs of perennial forage available for cattle grazing in the planning unit. Of the available AUMs, 3,123 AUMs are potentially suitable, including 1,092 AUMs that may be suitable with an MFP decision recognizing existing waters previously unrecognized as offered base (suitable waters). The balance of 2,031 AUMs could become suitable by developing additional waters.

Presently, all operators in the planning unit except Tom Roden (Newberry Mountains) and Wiley Roland (Stump Springs) hold 10-year permits. However, these permits convey no right or title to the resource or land. They are used primarily to insure loans from lending agencies.

All cattle operations are cow/calf. Registered breeds are nonexistent. The only purebred herd run is the Brahmas in the Wheeler Wash allotment. Crossbreeds are grazed on all other allotments. Calving occurs in February through May with a few late calves dropped in June. Cattle are handled twice a year, usually once in spring to brand and castrate calves and in the fall to wean. Quite often calves are held over through the next spring and sold as long yearlings.

(4) Range Suitability

Approximately 1% of the planning unit was determined to be inaccessible due to rocky and steep terrain during the 1979 range survey. Another 5% was classified as unsuitable for cattle grazing due to slopes of over 50%. Another 5% of the planning unit was classified unsuitable due to fragile soils (SSF of 60 or greater). Additionally 78% of the planning unit was classified as unsuitable for cattle grazing due to low perennial forage production (25 lb/acre or less). See Table .44-9 for a breakdown of range suitability classes by allotment.

TABLE .44-8
Stateline Planning Unit

PRESENT ALLOTMENT PRODUCTION AND USE

Allotment ADP # *1	Allotment	Acres	Average Ephemeral Licensed Use 1975-1979 *2 (AUMs)	Operators	Type Base *3	Period of Use *4	Kind of Livestock*4	Suitable Perennial Production (AUMs)	Potentially Suitable Perennial Production*5 (AUMs)	Water Used @ 300 gal/ AUM *6 (1,000 gal)
5411	Ireteba Peaks	344,607 *7	1,849	Ebbie Davis	Water	Yearlong	Cattle	624	703	554.7
5412	Hidden Valley	69,436	445	Leon Sprouse	Water	Mar-May, Nov-Feb	Cattle	0	421	133.5
5413	McCullough Mountains	230,272	2,670 *8	Gene & Veda Myers	Water	Yearlong	Cattle, Sheep	2,600	427	801
5414	Christmas Tree Pass	89,255 *7	2,502 *8 C 1,209*10 S	Gene & Veda Myers	Water	Yearlong	Cattle, Sheep	0	0	848.7
5415	Newberry Mtn	70,384 *7	0	Tom Roden	Water	No Use	-	306	331	-
5416	Jean Lake	137,217	3,529 *9	Gene & Veda Myers	Water	Yearlong	Cattle	1,938	290	1,058.7
5417	South Point	22,998	216	Emilio Soto	Water	Yearlong	Cattle	0	17	64.8
5418	Crescent Peak AMP	119,320	5,986	Searchlight Ranch	Water	Yearlong	Cattle	778	0	1,795.8
5421	Roach Lake	14,986	292	Ebbie Davis & Dick Dawson	Water	Yearlong	Cattle	24	103	87.6
5422	Kyle Canyon	34,494	0	Jim Jiminez	Water	No Use	-	0	0	-
5424	Black Butte	36,312	56 *10	Robert Spurlock	Water	Yearlong	Cattle	0	0	16.8
5426	Table Mountain	88,537	174 *11	Ebbie Davis & Dick Dawson	Water	Yearlong	Cattle	0	0	52.2
5427	Stump Springs	50,535	228 *11	Roland Wiley	Water	Yearlong	Cattle	0	238	68.4
5428	Younts Spring	23,202	149	Thorne-Estate	Water	Yearlong	Horse	0	0	44.7
5442	Lucky Strike	138,776	240	Vernon Young	Water	Yearlong	Horse	65	0	72
5431	Wheeler Wash	129,678	1,251	ES Bowman & Sons	Land	5/1-11/15	Cattle	222	593	375.3
Subtotal		1,600,009	20,796					6,557	3,123	5,974.2

PRESENT ALLOTMENT PRODUCTION AND USE

Allotment ADP # *1	Allotment	Acres	Average Ephemeral Licensed Use 1975-1979 *2 (AUMs)	Operators	Type Base *3	Period of Use *4	Kind of Livestock*4	Suitable Perennial Production (AUMs)	Potentially Suitable Perennial Production*5 (AUMs)	Water Used @ 300 gal/ AUM *6 (1,000 gal)
3333	Roses Spring	12,330	-	- *12	Water	No Use	-	0	647	-
4444	Spring Mountain	310,364	-	- *12	Water	No Use	-	0	1,535	-
8888	Wheeler Slope	98,952	-	- *13	Water	No Use	-	0	0	-
Subtotal		421,646	0					0	2,182	-
2222	Unallotted	3,732	0	-	-	-	-	0	0	-
5555	Unallotted	6,786	0	-	-	-	-	0	0	-
6666	Unallotted	10,371	0	-	-	-	-	0	0	-
7777	Unallotted	62,243	0	-	-	-	-	0	64	-
Subtotal		83,132	0	-	-	-	-	0	64	-
TOTAL		2,104,787	20,796					6,557	5,369	5,974.2

*1 ADP numbers are computer identification numbers used in the range survey to identify allotments.

*2 Allotments were classified ephemeral since 1969, numbers fluctuated so average was used.

*3 Ownership of base (water or land) on ephemeral range is not commensurate to any assigned grazing privileges. Base entitles the range user to the privilege of applying for grazing use on ephemeral range.

*4 These are not formally designated, categories portray use over last five years.

*5 Suitable range outside of base water service areas.

*6 Average past use over last five years.

*7 Acreage includes lands within Lake Mead NRA subject to withdrawal.

*8 Licensed use does not depict true past use. Licensing in past by 1/2 total for both allotments, sheep use correct. Myers says he has grazed 100 cattle yearlong in Christmas Tree Pass.

*9 Average for 4 years.

*10 Average for 2 years.

*11 1 year use, 4 years no use.

*12 No operator, base owners not in livestock business.

*13 No operator, base located on adjacent sec. 15 grazing lease & does not service allotment.

TABLE .44-9
Stateline Planning Unit

SUITABILITY CLASSES BY ALLOTMENT

Allotment ADP #	Allotment	Acres Suitable Perennial	Acres*1 Potentially Suitable Perennial	Total*2 Perennial Acres	Acres*2 Unsuitable Low Production Below 3,200' Elevation	Acres*2 Unsuitable Low Production Above 3,200' Elevation	Acres Unsuitable Due to Slope >50%	Acres Unsuitable Due to SSF >60	Acres Unsuitable Because of Rock	Total Allotment Acres
5411	Ireteba Peaks	11,559	12,864	24,423	172,050	96,077	15,880	36,138	39	344,607
5412	Hidden Valley	0	3,396	3,396	33,800	28,131	3,918	191	0	69,436
5413	McCullough Mountains	39,936	8,391	45,327	55,979	79,178	11,698	33,780	4,310	230,272
5414	Christmas Tree Pass	0	0	0	66,039	17,414	5,388	0	414	89,255
5415	Newberry Mountains	2,376	1,764	4,140	42,243	9,229	7,114	6,238	1,420	70,384
5416	Jean Lake	31,601	4,833	36,434	34,837	40,303	6,548	16,106	2,989	137,217
5417	South Point	0	311	311	18,171	0	138	4,378	0	22,998
5418	Crescent Peak	12,225	0	12,225	28,087	76,444	914	1,620	30	119,320
5421	Roach Lake	490	1,617	2,107	10,897	751	446	785	0	14,986
5422	Kyle Canyon	0	0	0	9,921	23,825	748	0	0	34,494
5424	Black Butte	0	0	0	19,341	10,357	2,526	4,088	0	36,312
5426	Table Mountain	0	0	0	25,102	55,617	7,540	0	278	88,537
5427	Stump Springs	0	4,854	4,854	17,077	28,604	0	0	0	50,535
5428	Younts Spring	0	0	0	0	22,862	340	0	0	23,202
5442	Lucky Strike	970	0	970	0	129,322	8,484	0	0	138,776
5431	Wheeler Wash	4,824	8,198	13,022	0	105,065	11,591	0	0	129,678
Subtotal*3		100,981	46,228	147,209	533,544	723,179	83,273	103,324	9,480	1,600,009

TABLE 4-9(continued)
Stateline Planning Unit

SUITABILITY CLASSES BY ALLOTMENT

Allotment ADP #	Allotment	Acres Suitable Perennial	Acres*1 Potentially Suitable Perennial	Total*2 Perennial Acres	Acres*2 Unsuitable Low Production Below 3,200' Elevation	Acres*2 Unsuitable Low Production Above 3,200' Elevation	Acres Unsuitable Due to Slope >50%	Acres Unsuitable Due to SSF >60	Acres Unsuitable Because of Rock	Total Allotment Acres
3333	Roses Spring	0	8,304	8,304	0	2,017	2,009	0	0	12,330
4444	Spring Mountain	0	47,818	47,818	0	232,264	19,449	2,835	7,998	310,364
8888	Wheeler Slope	0	0	0	0	93,578	1,984	1,705	1,685	98,952
Subtotal*4		0	56,122	56,122	0	327,859	23,442	4,540	9,683	421,646
2222	Unallotted	0	0	0	328	0	1,883	1,521	0	3,732
5555	"	0	0	0	0	6,450	0	0	336	6,786
6666	"	0	0	0	8,855	0	1,516	0	0	10,371
7777	"	0	4,900	4,900	50,007	4,216	3,120	0	0	62,243
Subtotal*5		0	4,900	4,900	59,190	10,666	6,519	1,521	336	83,132
Total		100,981	107,250	208,231	592,734	1,061,704	113,234	109,385	19,499	2,104,787*6

*1 Acres of vegetation types producing 25 lb/acre of perennial forage or better outside of a 4-mile radius of water

*2 Ephemeral forage may be licensed for livestock grazing in all these vegetation types when produced, if serviced by water during the period of use

*3 Allotments having base property owned by livestock operators

*4 Allotments with base property owned by those not in the livestock business, or with no base property

*5 Areas never allotted

*6 Total allotment acres for the planning unit does not equal total BLM administered acres, because other agency lands and private lands are included within some allotments

*** The opportunity exists to license livestock grazing on annual forage on ephemeral and ephemeral/perennial ranges when such forage is present.

*** There is an opportunity to reclassify several allotments from ephemeral to perennial/ephemeral range. See Table .44-10.

TABLE .44-10
Stateline Planning Unit

OPPORTUNITIES FOR EPHEMERAL/PERENNIAL CLASSIFICATION

Allotment Name	Avg AUMs Use (5 Yr Avg)	Class	Suitable Perennial*	
			Acres	AUMs
Ireteba Peaks	1,849	C	11,559	592
Hidden Valley	445	C	0	0
McCullough Mountains	2,670	C,S	39,936	2,600
Jean Lake	3,529	C	31,601	1,938
Wheeler Wash	1,251	C	4,824	222
Crescent Peak	5,986	C	12,225	778
Lucky Strike	240	H	970	65
Newberry Mountains	0	-	2,376	306
Spring Mountains	0	-	0	0**
Wheeler Slope	0	-	0	0
Roses Spring	0	-	0	0**

C-Cattle H-Horses S-Sheep

* 1979 Clark County Range Survey

** No suitable waters could be identified for these allotments because the base waters no longer belong to individuals in the livestock business. Should base waters be transferred or new property belonging to a qualified applicant be added, the Roses Spring allotment would produce 647 AUMs of suitable perennial forage and the Spring Mountain allotment 1,535 AUMs.

The South Point, Stump Springs, and Roach Lake allotments also have the potential to be classified perennial/ephemeral. However, little opportunity exists for the improvement of perennial forage through management on these allotments, therefore they should not be authorized to maintain a base herd, which reclassification would allow.

*** Since a range survey is a snapshot in time of forage availability, the opportunity exists through studies and monitoring to establish proper long-term stocking levels on ephemeral/perennial ranges.

(5) Allotment Management Plans

The Crescent Peak AMP is the only approved AMP in the Stateline Planning Unit. The AMP is fully implemented except for the

Crescent Springs pipeline. The AMP covers a Section 3 permit allotment that lies in Nevada and a Section 15 lease that lies in California's Riverside District. Section 3 and 15 relate to the section of the Taylor Grazing Act which authorizes the use. Only one operator is licensed to graze cattle in the two individual allotments. See Table .44-11 for information on this AMP.

TABLE .44-11
Stateline Planning Unit
CRESCENT PEAK AMP

	<u>Crescent Peak--NV</u>	<u>Crescent Peak--CA</u>
Active AUMs	Ephemeral range	1,560
Suspended Non-Use	None	None
Percent of Use	100	100
Class of Livestock	Cattle	Cattle
Number of Cattle	400 (base herd)	130
Season of Use	Yearlong	Yearlong
Base	Water	Has no base at present time

Grazing Schedule:

<u>Grazing</u> <u>Year</u>	<u>Approximate Use Periods</u>				
	<u>Summer Pastures</u>			<u>Winter Pastures</u>	
	I	II	III	IV	V
1979	Jul-Dec	Oct-Dec	Rest	Rest	Jan-June
1980	Oct-Dec	Rest	Jul-Dec	Jan-June	Rest
1981	Rest	July-Dec	Oct-Dec	Rest	Jan-June
1982	July-Dec	Oct-Dec	Rest	Jan-June	Rest

At the present time there is an administrative agreement whereby the Las Vegas District is responsible for issuing grazing permits, leases, authorizations, and trespass actions. Riverside District has retained administrative responsibilities for all other resource management. There have been no problems with this type of agreement.

The Section 3 permit allotment has been licensed under an ephemeral grazing permit with no set number of AUMs. The California Section 15 lease has a carrying capacity set at 1,560 AUMs or 130 cattle yearlong. Records indicate that except for a few years when steers were run, 400 cattle have been the base herd run on the Nevada allotment. The AMP was approved in June of 1971 and since that time there has never been less than the 530 head base herd licensed on the allotment. In most years about 200+ yearlings are carried over until June and then some weaned calves are picked up and licensed in September and November. There have been only a couple of drought years when the operator has been told that he could not license any more

cattle than the 530 base herd. The last pasture was constructed in 1974 and the grazing system was implemented at that time.

In about 1976 an amended AMP was drafted that set the carrying capacity of the Nevada allotment at 400 cattle yearlong, with recognition of adjustments due to annual forage production. Even though this draft was never approved by the Las Vegas District Manager, the Nevada allotment has been managed under this concept.

It is too early yet to quantify the full effectiveness of the AMP. However, it is felt that the grazing schedule is doing the job it was set up to do. Vegetation changes take long in the Mohave Desert. It may be 5 to ten years before a good perennial seed crop is produced and conditions are right for seeds to sprout and seedlings to establish themselves. On the other hand, when favorable conditions do occur vegetation responses can be dramatic.

The only apparent problem with the grazing schedule is in the use of the two winter pastures. The schedule calls for deferred rotation of the two pastures--one pasture to be used and the other to be rested each year. There is a question as to whether there is enough forage in just one of these pastures to carry the 530+ cattle from the last part of December until spring growth takes over about the 1st of March. The two winter pastures are very ephemeral as far as livestock forage production is concerned. Up till now cattle have either used both pastures the entire winter-spring grazing period, or they have used both as winter pastures only until spring green up occurs then used only one pasture on a deferred system.

The former operator had complained about the pasture fences, requesting the removal of the fence between the two winter pastures, and the fence between pastures 1 and 2. He stated that the fence between pastures 1 and 2 is breaking up established use patterns and cattle are coming up against the fence, standing there, and dying of thirst. Removing the fences would cut the cost of handling of the livestock in half. A loss of a grazing treatment, seed tromp, in one of the summer pastures would occur if the fence between pastures 1 and 2 was removed. There is a need for better water distribution in the western portions of pastures 1 and 2.

Ten trend plots have been read four times since 1976. No change in composition due to grazing can be seen. Black grama experienced mass dieback due to drought in the allotment in 1976.

*** There is an opportunity to establish rain gauges to better evaluate the studies already implemented on the AMP. If it

becomes evident that just one of the winter pastures can not carry the herd during January through June, then the grazing schedule can be adjusted by either leaving the cattle in the summer pastures until spring green up occurs, or by turning them out into the summer pasture in May. This can best be done on a yearly basis as forage conditions warrant. A fixed moving date is not recommended.

Since the allotment is water base it is felt that the operator should take the lead in developing new waters (except for the Crescent Peak pipeline that is approved in the AMP).

*** The following opportunities exist to improve the AMP:

- Install Crescent Peak Pipeline
- Increase storage at Cripple Jack Well
- Install another trough along 6 Mile Pipeline
- Drill a well in Monday Basin in California
- Develop water from CalNevAri
- Extend a pipeline from the YKL pipeline to replace the service area of Jack's Well.

The Wheeler Wash, Crescent Peak, McCullough Mountains, Ireteba Peak, and Jean Lake allotments produce enough perennial forage to support a base herd yearlong. They have potential for improving the vigor of key perennial shrubs, grasses, and forbs, though the success of the operations on these allotments relies heavily on the vegetation types producing annual forage.

*** There is an opportunity for this improvement through implementing Allotment Management Plans on these allotments. The complexity of these plans will vary with allotment, though the cost/benefit ratio of implementation will probably be low in all the allotments. The Hidden Valley allotment also has the potential for improved vigor of perennial grasses and shrubs. It is a small allotment, however, and its size may limit it from being split into pastures. An alternative for this allotment would be changing the current spring removal date from May 1 to April 15.

These AMPs should stress the following key species, these varying with allotment: big galleta, black grama, Indian ricegrass, needlegrass, bush muhly, globemallow, and Mormon tea. Although winterfat has been present in fecal samples it is not believed to be a key forage species in the planning unit.

(6) Land Treatment and Management Facilities

The Developments and Facilities Overlay prepared for URA 2 depicts fences, cattleguards, corrals, range study plots, and seedings.

Table .39-2 and .39-3 list non-water range improvements for which current records exist.

A basic discussion of these facilities can be found in Section .39, Developments, Facilities, and Services.

Species seeded in the Wheeler Pass burn were crested wheatgrass, blue grama, and dropseed. Those seeded in the Bonanza burn were crested wheatgrass, antelope bitterbrush, small burnet, sand dropseed, blue grama, Lincoln brome, siberian wheatgrass, intermediate wheatgrass, Ladak alfalfa, and fourwing saltbush.

*** There is an opportunity to issue a temporary use permit to graze the Bonanza burn with a few head of cattle. The present operator would be willing to truck or drive his cattle into the area. The drawbacks to allowing this use are the extremely close proximity of the burn to unfenced National Forest land, unfenced private land currently being developed as subdivisions, and the unfenced Cold Creek Recreation Area.

It should be stressed that, because of the low, erratic precipitation patterns, any seeding will have an above average chance of failure. More than one application of seed, in subsequent years, may be included in the planning. Protection of a seeding from large grazing animals for several years may be important to its success. The effects of terpenes as phytopathogens should be well considered in the timing of the seedings. Normally these terpenes will wash from the soil during a wet period or are eliminated by fire. Pinyon, juniper, sagebrush, blackbrush and many other woody plants are heavy producers of terpenes.

Perhaps the only area capable of successful seeding is in the vicinity of Cold Creek.

*** The Jean Lake, Lucky Strike, Wheeler Wash, and Wheeler Slope allotments carry the potential for prescribed burning. The sites with this potential are all above 4,500 feet in elevation. The old burns in Cottonwood Valley, which burned in 1944 (blackbrush) with a subsequent fire in 1947, have not yet revegetated with good grazing plants. This is at 4,000 feet with an east facing slope. The area will support ephemeral vegetation in years of above normal precipitation. In very wet years, which occur about once in 10 to 30 years, large amounts of ephemeral vegetation are available for grazing up to 1/4 acre/AUM.

Areas for prescribed burns must be carefully selected. Probably only those areas in the Wheeler Wash allotment would be worth a prescribed burn if seeded afterwards, when comparing costs to

benefits. Prescribed burns to reduce fuel loading and release underbrush would be beneficial in this allotment, however, this would have to be an ongoing project. Burns in Wallace Canyon and near Trough Spring, both in the Wheeler Pass allotment, have released shrubs which may not be high in palatability but at least provide forage where dense pinyon-juniper stands previously prevented its growth. The operator encourages a prescribed burn both from this standpoint and that of easier access for management.

*** A modified fire suppression policy should be adopted where undesirable vegetation types for grazing could be allowed to burn if danger to life or private property was not likely. This would be beneficial in the blackbrush vegetation types in the Lucky Strike, Crescent Peak, Jean Lake, McCullough Mountain, Ireteba Peak, Christmas Tree Pass, Newberry Mountains, Roach Lake, Table Mountain, Kyle Canyon, Younts Spring, Spring Mountains, Roses Spring, Wheeler Wash, and Wheeler Slope allotments, and in the pinyon-juniper types in the Wheeler Wash allotment.

*** There is an opportunity for selected cutting of unwanted brush and trees to open understory growth, primarily in the Wheeler Wash allotment. Green cutting areas should be designated and open to the public when adequate manpower is available for compliance, in conjunction with the Toiyabe National Forest.

*** Many of the existing waters should be improved or redeveloped in order to produce their potential flow. Under ephemeral range regulations, the maintenance of base waters when the range is not in use is not required. Where water is needed for wild horses/burros, it will be necessary to make arrangements with the certificated water right holder. District policy states that BLM will not develop base waters on water base allotments, but can assist in piping and distributing the waters if necessary under an AMP.

Dependable water is derived from springs and wells which are properly developed and equipped. Reservoirs are not dependable because of frequent prolonged drought and the high siltload of runoff water. Snow is seldom available except during late winter on the highest mountains. The difficulty of obtaining and distributing water economically is preeminent.

*** There is an opportunity to develop better designed pipelines with storage facilities to gather water from the seasonal springs. Pipelines would be located out of the washes. Drilling of new wells and reequipping abandoned wells which consistently produce water should be encouraged. Water hauls should also be allowed, however, they should not become the only source of water on an allotment if stationary. A good opportunity exists to allow more

water hauling to troughs which can be easily moved to allow rest to forage species. This should be encouraged in all allotments.

*** There is currently no water on the Wheeler Slope allotment and it is not allotted. It may be possible to drill a well to procure water or to pipe water from Cold Creek.

*** There is no water below the National Forest boundary on the Lucky Strike allotment. Wells may solve this problem.

*** Most of the base waters in the Kyle Canyon allotment are on private lands. Piping of the water off these private lands to serve livestock is needed.

The Wheeler Wash allotment is fairly well watered with springs and pipelines and the creeks which carry snowmelt in late winter.

*** The following allotments are fairly well watered at present. As AMPs are developed and fences are installed, additional waters may be needed. There are opportunities to improve the flow of existing springs through maintenance by the operators.

*** The following improvements were identified by the livestock operators as those they would like to have developed on their allotments.

Christmas Tree Pass

- Water haul at Deep Well
- Water haul at Battleaxe Well
- Water haul at Coast Guard Loran Station
- Pipe water across U.S. Highway 93 from Calnevari to present water haul site
- Redrill Juniper Well
- Install 2-3 miles of pipeline from Cottonwood Spring

McCullough Mountain:

- Fence the west side of U.S. Highway 93 to Railroad Pass
- Install 2 miles of pipeline north from 10 Mile Well with 2 troughs
- Build a reservoir halfway between Searchlight and 10 Mile Well
- Install 1 mile of pipeline from mining claim in Crescent Peak allotment to a point 3.5 miles west of Little Well
- Make a holding corral in the Brewer Well area
- Build 4 miles of fence from west slope of the North Highland Range to the McCullough Range

Ireteba Peaks:

- Drill a well to replace service area of the 3 water hauls on the east side of U.S. Highway 93.
- Install 3-4 miles of pipeline from Desert Queen Well south

Jean Lake:

- Improve McClanahan South Well
- Improve flow of Granite Springs
- Improve flow of Scotts Well Spring
- Install 1 mile of pipeline south from Jean Lake well
- Install pipeline 2-3 miles west from Calada Well
- Redrill old wells at millsite
- Build 5-6 miles of fence across Jean Lake

There are several waters built apparently in trespass, especially on the Ireteba Peaks allotment. These are identified as UAD (unauthorized development) on the BLM Water Developments Overlay prepared in URA 2, and listed in Table .39-3.

*** There is an opportunity to bring paperwork up to date on these projects and determine trespass damages.

*** There are opportunities to establish study plots of ungrazed areas at the Piute Water Spreader Dikes, the eastern right-of-way from the Nipton-Searchlight Highway (State Route 68) to the Crescent Peak northern boundary fence, and within the Erie Pasture field fence in the Jean Lake allotment.

(7) Other Problems and Special Situations

An ear-tagging program was begun in the planning unit in 1976. It is believed that this program alleviated trespass at its inception.

*** There is an opportunity to follow-up on ear-tagging which is much needed for trespass compliance on the large acreage and rough terrain of the planning unit.

There are incidents of trespass reported consistently in the Red Rock Canyon and Lovell Canyon areas. More patrols are needed.

Conflicts with livestock grazing exist in the metropolitan Las Vegas Valley (see Section .41, Lands, Las Vegas Valley Sub-Unit). However, there are large areas of contiguous public lands with the Las Vegas Valley which can be grazed.

*** An opportunity exists to license ephemeral use on areas of contiguous public lands in and adjacent to the Las Vegas Valley. These areas are identified below by the ADP numbers used in the

Clark County range survey, and are shown on the Grazing Administration Overlay.

5555 Unallotted
6666 Unallotted
7777 Unallotted
8888 Wheeler Slope (Unallotted)
2022 Sunrise Mountain

The town of Goodsprings, a small community in the Table Mountain allotment, experiences conflicts with livestock roaming through the townsite. Numerous complaints have been made to BLM, however, it is the responsibility of private landowners to mitigate this type of situation, usually through fencing. A similar problem occurred in the town of Jean. This situation was alleviated by action taken by the operator on the Roach Lake allotment, in cooperation with the Clark County Advisory Board, to fence that portion of the allotment through which livestock were entering the town.

The Spring Mountain allotment, which includes the RRCRL, has not been grazed since the State of Nevada acquired the Spring Mountain Ranch for a state park, buying the base property waters as well. Not being in the livestock business, the State of Nevada and its Division of State Parks are not qualified applicants for grazing privileges.

*** An opportunity exists to license use of ephemeral forage on the Spring Mountain allotment, including the RRCRL, to a qualified operator who can demonstrate possession/ownership of adequate waters to service such forage. Perennial grazing preference on the allotment should not be allocated until a qualified applicant appears.

Authorizing cattle grazing in the Kyle Canyon, Lucky Strike, and northern portions of Ireteba and McCullough Mountain allotments may cause hazards to motorists along the unfenced routes of U.S. Highway 93 and Nevada Highway 60.

BLM administers the grazing use on the Lake Mead National Recreation Area adjacent to this planning unit by agreement between the National Park Service and Bureau of Land Management. The approximate number of acres within the Park Service boundary by allotment is:

Ireteba Peaks	131,092 acres
Christmas Tree Pass	17,143 acres
Newberry Mountains	35,032 acres

These acres are from the 1973 Stateline URA. Acreage was not calculated separately for the Lake Mead NRA portions during the 1979 range survey.

Cattle are to be excluded from the Hoover Dam area and are licensed only below the southern edge of T.22S. A decision has been issued to drop this area from the allotment, and will be in effect as of July, 1981.

The Roses Spring, Wheeler Slope, and Spring Mountain allotments are currently void of licensed livestock grazing due to the sale of base waters.

*** There is an opportunity to authorize livestock grazing on the Wheeler Slope allotment in the future if a determination is made as to whether the 93,578 acres of this allotment producing less than 25 lbs/acre of perennial forage has the potential to produce more forage, the applicant shows ownership or control of water to service the allotment (initial stocking rate would be based on the carrying capacity of the vegetation types serviced by these waters and the applicant builds a fence along U.S. Highway 95.

*** No opportunity presently exists to license livestock grazing on the Roses Spring allotment. The current owners of the base waters are not in the livestock business. There is an opportunity to license 647 AUMs of livestock forage yearlong or more seasonally (summer-fall) if an applicant shows ownership or control of the base waters. There is also the opportunity to adopt a modified fire suppression policy, and/or allow post and pole, green firewood, and Christmas tree cutting over the entire 12,330 acres of the allotment to remove pinyon-juniper and release the understory browse species. Until demand exists for grazing the allotment there would be little benefit in investing in a prescribed burn plan. Problems with licensing grazing on the Roses Spring allotment include potential trespass onto adjacent

Toiyabe National Forest lands and creation of a nuisance on nearby private lands, including the Williams ranch in Trout Canyon and Sky Mountain Ranch in Lovell Canyon.

*** That portion of public lands common to the eastern boundary of the Black Butte allotment and the western boundary of the Roach Lake allotment is currently unallotted. During the adjudication of 1953 this area was outside of any 5-mile radius of a base water (service area,) therefore it was not included in an allotment. With the construction of a fence in the Black Butte allotment completed in 1980 this unallotted portion could be included in the Roach Lake allotment. A portion, 328 acres, of this area was classified ephemeral range by the 1979 range survey standards.

(8) Conflicts

The following grazing allotments in the Stateline Planning Unit overlap current bighorn sheep (Ovis canadensis nelsoni) distribution areas:

Spring Mountain	Jean Lake
Ireteba Peaks	Crescent Peak AMP
Hidden Valley	Roach Lake
McCullough Mountain	Kyle Canyon
Christmas Tree Pass	Black Butte
Newberry Mountains	Table Mountain

The available summer range within a 2-mile radius of free water is the limiting factor for bighorn sheep. These areas must provide the habitat of all the sheep in the herd during the summer months. These critical summer use areas are in:

The Lake Mead National Recreation Area portion of the Newberry Mountains allotment along the Colorado River
Around Ora Hanna Spring in the Highland Range of the McCullough Mountain allotment
In the McCullough Spring area of the McCullough allotment
The Railroad Spring area of the Jean Lake allotment
The Cave Spring area in the Table Mountain allotment
The Tule Springs-Knob Hill area of the Ireteba Peaks allotment
Along the Colorado River, north of the T.25S. and 20S. township line in the Ireteba Peak allotment
The Red Rocks escarpment in the Spring Mountain allotment

The McCullough Mountain Range is probably the one with the highest competition between cattle and sheep.

Waters are limited in all these areas, and cattle and sheep compete for space, water, and forage. Forage consumption between the two animals is similar in the summer and animals congregate around the same waters. This is critical to sheep within the two-mile radius.

*** There is an opportunity to alleviate competition by piping water away from its source and fencing the source. Fencing the allotments into pastures which would remove cattle from some of the mountainous areas during the summer would lessen competition. These would also have to be sheep fences.

Disease can be transmitted from domestic sheep to bighorn sheep. More discussion of specific domestic sheep use areas can be found in the Class of Livestock.

Mule deer (Odocoileus hemionus) currently inhabit the Spring, McCullough, and Newberry Mountains. These ranges lie within the following allotments:

Spring Mountain	Younts Spring
Wheeler Slope	Table Mountain
Wheeler Wash	McCullough Mountain
Lucky Strike	Jean Lake
Newberry Mountain	Christmas Tree Pass

Though livestock and deer do not normally overlap greatly in diet competition, in the Wheeler Wash allotment where the primary livestock forage is browse species there is some overlap.

Because of the size of the elk herd there is probably little competition between the cattle in the Wheeler Wash allotment and the Rocky Mountain elk herd.

Little if any livestock loss is attributed to predators in the planning unit. See Section .46, Wildlife, for discussion of species.

A conflict related to upland game birds and rabbits is the large concentration of hunters in the area of Searchlight. Range users often complain of fences left open and storage tanks shot up. The only opportunity to alleviate this problem is through educating the public and the range user.

Though not quantified, during years of peak population rodent use of desert vegetation can become noticeably high.

The desert tortoise, a reptile identified as rare by the State of Nevada, inhabits much of the planning unit. Areas of high density occur in the winter pastures of the Crescent Peak

allotment. The diets of desert tortoise and livestock may overlap as much as 40 percent during the month of March when ephemeral forbs are important in both animals' diets. During this time female tortoise are vulnerable because the reproductive effort involves high energy expenditures (Hohman and Ohmart 1980). During years of low annual forb production competition may be critical to the tortoise.

A minor conflict exists between wild horses and cattle in the Wallace Canyon and Wheeler burn areas in the Wheeler Wash allotment.

Potential conflicts exist if range improvements are planned in areas where threatened and/or endangered plants exist. This must be handled on a case-by-case basis.

Livestock operators have expressed informally to BLM field personnel problems with organized ORV events. Problems arise when fences are cut or gates left open, and cattle harrassed. Most problems are caused by spectators and not participants of these events. The Jean Lake, Ireteba Peaks, Cresent Peak, Roach Lake, and McCullough Mountain allotments experience a large number of ORV events annually.

*** The opportunity exists for BLM to facilitate and improve communication between range users and recreationists, and to encourage public education programs for urban users of public range lands.

*Memorandum*DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

IN REPLY REFER TO:

1608.3
(N-054)*ES 7/2/81*
To : ~~Chief, Planning & Environmental Coordination~~ Date: JUL 2 1981

FROM : Range Conservationist; P&EC

SUBJECT: Classifications for Allotments in Clark County

Reclassification of allotments, in Clark County from ephemeral to ephemeral-perennial or candidate ephemeral-perennial, was prepared using the criteria for ephemeral-perennial areas in the Special Rule for southwest Desert Ranges (BLM Manual 4112.5). The criteria used for reclassifying allotments were 1) area falls generally between 8" and 12" precipitation isolines and generally between 3,200' and 4,000' contour; 2) desirable perennial forage plants make up a significant part of the total composition.

If five percent or more of the acres in an allotment consist of vegetation types in which five percent of the plant composition is desirable forage species and the density is greater than eight percent; and the allotment was generally above 3,200' contour and five inches precipitation, the allotment was recommended for reclassification. A similar procedure was done for allotments proposed as candidate ephemeral-perennial. An allotment was considered in this category if five percent of the acres had vegetation types in which the plant composition was 2.5 percent desirable forage species and 15 percent intermediate species, and above eight percent density.

Candidate ephemeral-perennial allotments would continue to be managed as ephemeral, however they would be monitored and in ten years these areas would be evaluated to determine if they should be reclassified as ephemeral-perennial.

The enclosed table shows the total acres for each allotment which meet the criteria for both ephemeral-perennial. The percentage of acres in each category was calculated and is also shown on this table. When all the criteria were evaluated, the allotment was then recommended for ephemeral-perennial, candidate ephemeral-perennial, and ephemeral.

Enclosure

Louis Pignatella
*7/2/81**PJT in URA*
ES

RANGE CLASSIFICATION CRITERIA
Virgin Valley Planning Unit

Acres	% Acres Above 5% Desirable plants + 8% Density	Acres	% Acres Above 2.5% Desirable & 15% unterm- ediate Plants & 8% Density	Area Falls generally in 5" to 12" precip. isolines & generally between 3,200' & 4,000' Contour	Proposed Management Intensity
Acton-Farrier				No	E
Arrow Canyon				No	E
Azure Ridge				Yes	E
Billy Goat Peak				Yes	E
Bunkerville	6,966	5.1%		Yes	E-P
Dry Lake				No	E
Flat Top Mesa				No	E
Glendale				No	E
Gold Butte	7,698	4.5%		Yes	E
Hen Springs	3,171	16.7%		Yes	E-P
Jackrabbit				No	E
Lime Springs				Yes	E
Lower Mormon Mesa	3,677	8.4%		No	E
Mesa Cliff	4,317	54.5%		No	E
Mesquite				Yes	E
Muddy Mtn.	9,461	4.4%	19,323	9.1%	Yes Candidate E-P
Muddy River	351	1.8%		No	E
Overton Arm				No	E
Pittman Well				Yes	
Pulsipher Wash				No	E
Rox				No	E
Sunrise				No	E
Toquop Sheep				No	E
Upper Mormon Mesa			3,412	7.3%	Yes Candidate E-P
Ute				No	E
White Basin	2,346	1.4%		Yes	E
9999				No	E

RANGE CLASSIFICATION CRITERIA
Stateline Planning Unit

Acres	% Acres Above 5% Desirable plants + 8% Density	Acres	% Acres Above 2.5% Desirable & 15% unterm- iate Plants & 8% Density	Area Falls generally in 5" to 12" precip. isolines & generally between 3,200' & 4,000' Contour	Proposed Management Intensity
Black Butte		2,979	8.4%	No	E
Christmas Tree				No	E
Crescent Peak				Yes	E
Hidden Valley	27,066			Yes	E-P
Indian Springs				No	E
Ireteba	293	1,178	.35%	Yes	E
Jean Lake	39,598			Yes	E-P
Kyle Canyon	7,698			Yes	E-P
Lucky Strike	44,501			Yes	E-P
McCullough Mtn	34,723			Yes	E-P
Newberry	1,231			No	E
Roach Lake	1,610			Yes	E-P
Rose Springs		2,026	1.6%	Yes	E
South Point				No	E
Spring Mtn.	48,066			Yes	E-P
Stump Springs				No	E
Table Mtn.	3,189			Yes	E
Vegas Valley				No	E
Wheeler Slope	5,448			Yes	E-P
Wheeler Wash	1,189			Yes	E
Yount Springs				No	E



5. Grazing Administration - Wild Horses/Burros

Overlays

Two overlays have been prepared for each planning unit. One shows the location of wild horses and burros as of January 1, 1971; their location and numbers in present use areas; and crucial areas. The second overlay shows opportunities for management of wild horses/burros and their habitat, including boundaries of proposed Habitat Management Plans, vegetation treatments, and water developments.

Tabulations

Calculation of the numbers of horses and burros in each use area was completed as of May 25, 1979, and is illustrated in the following tables.

Table .44-12	Virgin Valley-Habitat Improvement Through Vegetation Manipulation.....	64
Table .44-13	Virgin Valley-Wild Horse/Burro Population Statistics.....	66
Table .44-14	Virgin Valley-Wild Horse/Burro Forage Requirements and Availability.....	67
Table .44-15	Stateline-Habitat Improvement Through Vegetation Manipulation.....	68
Table .44-16	Stateline-Wild Horse/Burro Population Statistics.....	70
Table .44-17	Stateline-Wild Horse/Burro Forage Requirements and Availability.....	71

Narrative

a. Population History

Longtime residents of the county say that many of the wild horses are descendents of horses released by, or escaped from, ranchers and horse owners, and which were never recaptured. Prior to 1971, local ranchers and horse dealers rounded up wild horses for use as pleasure or work animals or to sell for slaughter.

The younger and the extremely old animals were removed, and studs and mares, the breeding population, were released. Sometimes the older stallions were also kept, and the ranchers released young purebred stallions in place of the older studs to add new blood to the gene pool and prevent inbreeding.

Burros are descendants of those animals which were released or escaped from early prospectors or sheepherders. Since burros are native to the arid deserts of North Africa and Eurasia, these animals adapted quite readily to the southwest American desert. All the burros are of common descent and few new breeding animals have been introduced into the population, as in the case of horses.

The populations of wild horses and burros tended to fluctuate prior to December, 1971. Periodic roundups kept the population at a low level. Since that date, population growth has been uncontrolled. The only horses or burros removed from the population since 1972 have been problem animals, lame or sick animals, or those killed in accidents with motor vehicles.

Both horses and burros were considered pests and "fair game" until the Wild, Free-Roaming Horse and Burro Act (P.L. 92-195) was passed by Congress on December 15, 1971. Very little is known about "natural" wild horse and burro population dynamics prior to that date, because of the periodic removals of useable or nonbreeding animals.

An inventory of wild horses and burros on the Las Vegas District was conducted beginning March 7, 1973, using both helicopters and fixed-wing aircraft.

Wild horse reproduction rates have not been studied extensively in the southwest, but young/adult ratios estimated during population counts since the passage of P.L. 92-195 in 1971 indicate the reproduction rate to be 12 to 16 percent, depending on winter-spring precipitation. An annual rate of increase of 20 percent was used during 1973, 1974, and 1975 to calculate horse/burro population increase. The 20 percent figure was apparently selected from observations of reproduction rates of domestic range horses, less the estimated mortality rate of older animals, which would be removed from a domestic herd.

Burro studies conducted in Arizona have shown the annual reproduction rate to fluctuate, but average 15 percent over a period of several years. These studies did not consider mortality in determining rate of increase, but used the recruitment rate (reproduction) in estimating population growth.

Virgin Valley Planning Unit

The inventory of 1973 produced a total count of 18 horses and 5 burros in the planning unit. This count was apparently used as the actual wild horse/burro numbers found on public lands administered by BLM. However, the Lake Mead National Recreation

Area was not inventoried and almost all of the burros move back and forth between the NRA and BLM administered lands.

Three areas where horses/burros are presently found in the planning unit are the Gold Butte-Grand Wash, Arizona area; the Arrow Canyon, Moapa, lower Meadow Valley Wash area; and the Muddy Mountains area. When comparing the inventories of 1973 and 1979, slight differences between these areas were noted. The difference may be attributed to more efficient inventory methods and more experienced observers in the second inventory, as well as the time of the year the inventory was conducted.

The range of burros in the Gold Butte area is smaller at present than in 1973. An allotment boundary fence was constructed along Mud Wash (refer to base map) in 1973 and burros are effectively segregated to the south of the fence. This area and the Muddy Mountains area extend into the Lake Mead National Recreation Area, where horses and burros apparently were not counted during the earlier surveys. Some of the horses may be domestic, branded animals. The permittee is authorized to graze horses in the Muddy Mountains allotment. These horses are in direct competition with wild horses (if any are found in the area) for forage, water, and living space.

The animals around Moapa and west of Lake Mead were also kept at a low level. Very few animals (burros) were removed from the Gold Butte area, although many were shot and left to decay. The person who removed burros from this area is unknown, but evidence of a roundup was found and reported. No record was kept of the person who reported the removal, or when the action occurred. The shot animals were likewise reported, but no other information exists. Few were rounded up because of the terrain and long distance to haul a few burros.

See the Wild Horse/Burro Habitat Overlay for areas of 1971 and present population.

Competition for forage between wild horses/burros and livestock has not been studied in this area, but indications are a moderate to high overlap of use. Forage inventories indicate low production of forage in both the Gold Butte and the Muddy Mountains-White Basin areas in the Virgin Valley Planning Unit. Competition for water appears to be much less, since the burros utilize the area near Lake Mead much more heavily than do livestock.

*** Opportunities: Opportunities for natural improvement of the habitat, specifically forage, are highly limited in the Virgin Valley Planning Unit, because of adverse climatic conditions. Even with total exclusion of grazing, noticeable improvement of

forage occurs very slowly. See the Wild Horse/Burro Management Opportunities Overlay.

An opportunity exists to improve habitat for burros in the Gold Butte Unit (the Gold Butte and part of the Azure Ridge allotments), by reducing livestock use. Livestock presently graze the allotment yearlong. Seasons-of-use can be established to alleviate competition for forage during the spring-summer months, which are generally the most critical, due to climatic conditions of high heat and low forage production.

Forage availability could be improved in the Gold Butte area by managing, rather than controlling wildfire. Fire can reduce undesirable plants in all but creosote bush vegetation types and can allow more palatable species to increase in volume.

The area is too rough and rocky in most areas for other vegetation manipulation techniques. Seeding a burned area would be impractical because of adverse climatic conditions, so natural revegetation must occur. See Table .44-12 for vegetation manipulation opportunities.

TABLE .44-12
Virgin Valley Planning Unit

HABITAT IMPROVEMENT THROUGH VEGETATION MANIPULATION

<u>Treatment</u>	<u>Acres</u>	<u>Potential AUM Increase</u>
Wildfire Management	15,000	1,500

An opportunity exists to designate Herd Management Areas (HMAs) and develop Herd Management Area Plans (HMAPs). This would facilitate management of these areas for the optimum benefit of wild horses and burros and the vegetation resource. The following areas are suggested for this designation.

HMA 1 Gold Butte, including part of Grand Wash, Arizona

HMA 2 Muddy Mountains-White Basin

Domestic horses should be removed from the Muddy Mountains-White Basin area, and further grazing by domestic horses cancelled.

The Arrow Canyon, Moapa, lower Meadow Valley Wash area should be included in and managed with the Meadow Valley Wash area in the Caliente Planning Unit, since the Meadow Valley Wash area contains a larger area and more animals than are found in Clark County. No barrier exists to prevent movement from the Caliente Planning Unit to the Virgin Valley Planning Unit. The latter area appears to furnish winter habitat, when water availability

is not critical and the burros can travel a greater distance from water to a feeding area.

(See Table .44-13 for HMA acreages and herd populations.)

Establish numbers to be managed in each HMA as follows.

HMA 1 - Gold Butte - 200 burros

HMA 2 - Muddy Mountains-White Basin - 45 burros (and 15 horses, if the horses are not branded animals)

The numbers recommended were suggested by the National Park Service in 1979. Vegetation inventories indicate that intraspecific competition will occur if the population level is not reduced. See Table .44-14 for forage availability and demands in the proposed HMAs.

Stateline Planning Unit

Animals counted in the 1973 inventory were 18 horses and 26 burros in areas outside allotments which were authorized to graze domestic horses. This count was apparently used as the actual horse/burro numbers as of that date.

When comparing the inventory of 1973 to that of 1979, differences between occupied areas were noted. This may be attributed to more efficient inventory methods and greater experience on the part of the observers during the latter inventory.

Two areas of present population concentrations are recognized in the Stateline Planning Unit: the Spring Mountain Range, including the Red Rock Canyon Recreation Lands and the Bird Spring Range; and the Eldorado Mountains. The Spring Mountain area also includes the west end of the range (including Mount Stirling), although this area is in Nye County. Both horses and burros can move back and forth across the county line, even though many animals "home in" around a specific water source.

Forage is limited at lower elevations in the Spring Mountain area. In most of the habitat area, very little competition occurs between livestock and wild horses/burros. Livestock have not grazed the area on the east end of the Spring Mountain Range for the past ten years. The horses found in that area apparently move with the seasons, grazing the desert floor bajada areas in the winter-spring, and moving up into the pinyon-juniper areas during the late spring through early fall months.

TABLE .44-13
Virgin Valley Planning Unit

WILD HORSE/BURRO POPULATION STATISTICS

Herd Management Area Name	Acres			Horses*			Burros**		
	BLM	Other Fed.	Other	Adult	Yearling	Young	Adult	Yearling	Young
#1 Gold Butte (Incl. portion of Grand Wash Unit in AZ.)	132,000	115,000	700	0	0	0	239	93	22
Arrow Canyon, Moapa, ¹ Lower Meadow Valley Wash	180,000	800	2,000	0	0	0	0	0	0
#2 Muddy Mountains	75,000	93,000	200+	9	0	2	42	13	4

* Horse numbers are actual counts, calculated May 25, 1979. Since no research has been conducted, no estimates were made. However, according to inventory indices, only 60 percent of the individual animals being inventoried are expected to be counted. Based on this information, the horse population in the Muddy Mountains could be as many as 18 animals.

** Burro numbers are inflated by a factor derived from the Lincoln Index, developed from the Gold Butte Area Inventory, April 1979.

1. No horses/burros were observed, but evidence of animal presence was observed.

Source: Clark County Wild Horse/Burro Inventory.

TABLE .44-14
Virgin Valley Planning Unit

WILD HORSE/BURRO FORAGE REQUIREMENTS AND AVAILABILITY

Allotment	Total AUMs Available	AUMs Required by WH&B *	Livestock Demand	AUM Deficit From Suita- ble Range
Gold Butte (HMA 1)	2,405 1,873 U	2,400	5,700 (C)	5,395
Muddy Mountains (HMA 2)	990 U	924	--	924

U - AUMs from areas unsuitable for domestic livestock (cattle) grazing.

* - for numbers of animals to be managed for.

The Eldorado Mountains were not surveyed in 1973, because the burro herd was believed to be located solely on the Lake Mead National Recreation Area. Subsequent inventories have shown that the burros utilize lands inside and outside the NRA.

*** Opportunities: Opportunities for natural habitat improvement are limited in the Stateline Planning Unit. Most of the area inhabited by horses and/or burros is grazed seasonally or not at all by domestic livestock. The horse/burro population is low, so the only areas being heavily used are around permanent water sources. Natural improvement of forage, both in condition and production, occurs very slowly because of adverse climatic conditions in southern Nevada.

Forage availability can be improved in the Spring Mountains-Bird Spring Range through controlled burns and/or chaining or plowing followed by seeding of selected sites. In many sites, the dominant vegetation, pinyon-juniper and sagebrush, has eliminated many forage plants.

Wildfires could be managed in those areas where other resource values are low and rehabilitation through seeding can be accomplished. Controlled burns, with seeding, could also be used to improve habitat.

Vegetation manipulation, in the form of chaining, plowing, or spraying and seeding, is feasible only at mid-elevations or higher in the Spring Mountains. Vegetation types which may be treated include sagebrush, pinyon-juniper, and blackbrush where this species begins to intergrade with sagebrush. Any treatment must be fenced and protected from grazing for two growing seasons.

See Table .44-15 for vegetation manipulation opportunities.

TABLE .44-15
Stateline Planning Unit

HABITAT IMPROVEMENT THROUGH VEGETATION MANIPULATION

<u>Treatment</u>	<u>Acres</u>	<u>Potential AUM Increase</u>
Chain or burn/seed	7,500	375
Burn/seed	1,200	60
Chain or plow/seed	3,200	160

Water is the limiting factor for habitat development or improvement. Pipelines, reservoirs, or water wells can be developed to enhance or improve habitat for the horses/burros in the Spring Mountain area. Pipelines can be extended from springs or wells to protect the source from trampling and extreme

overuse. Earthen reservoirs would be used seasonally after being filled with runoff from rainfall, to supplement permanent waters, and alleviate grazing pressure about the permanent waters.

An opportunity exists to designate Herd Management Areas (HMAs). This would facilitate management of these areas for optimum benefit of wild horses and burros and the vegetation resource. The following areas are suggested for this designation.

HMA 3 Spring Mountain Range, including Red Rock Canyon
Recreation Lands and Bird Spring Range

HMA 4 Eldorado Mountains

(See Table .44-16 for HMA acreages and herd populations.)

Based on forage availability, consideration of the several unallotted areas in the Spring Mountains, and sightseeing opportunities, establish numbers of horses/burros to be managed as follows:

HMA 3 - Spring Mountains - 80 horses, 75 burros

HMA 4 - Eldorado Mountains - 45 burros

See Table .44-17 for forage availability and demands in the allotments where wild horses/burros are found.

b. Seasonal Use Areas

Virgin Valley Planning Unit

Horses appear to utilize only the southern portion of the Muddy Mountains and most of White Basin (HMA 2). The use pattern appears to expand around permanent water sources during the cooler seasons of the year and contract during the hot summer. Horses have been observed in shady areas near water during the hottest part of the day and moving out for forage in the late afternoon.

No migration pattern for these horses is evident. The animals can move for only a few miles (less than 25 miles) in any direction, because of both natural and artificial barriers.

Horse and burro "home ranges" overlap in the Muddy Mountains-White Basin area (HMA 2). Burros are found nearer Lake Mead than are horses. Burros tend to move toward rougher sites in the foothills of the Black and Muddy Mountains during

TABLE .44-16
Stateline Planning Unit

WILD HORSE/BURRO POPULATION STATISTICS

Herd Management Area Name	Acres			Horses*			Burros**		
	BLM	Other Fed.	Other	Adult	Yearling	Young	Adult	Yearling	Young
#3 Spring Mountain Range, (Incl. Red Rocks Rec. Area & Bird Spring Range)	740,000	87,000	2,000	29	1	3	29	2	2
#4 Eldorado Mtns.	100,000	140,000	600	0	0	0	51	17	0

* Horse numbers are actual counts, calculated May 25, 1979. Since no research has been conducted, no estimates were made. According to inventory indices, only 60 percent of the individual animals being inventoried are expected to be counted. Based on this information, the horse population could be as many as 55 animals.

** Burro numbers are inflated by a factor derived from the Lincoln Index, developed from the Gold Butte Area Inventory, April 1979.

Source: Clark County Wild Horse/Burro Inventory.

TABLE .44-17
Stateline Planning Unit

WILD HORSE/BURRO FORAGE REQUIREMENTS AND AVAILABILITY

Allotment	Total AUMs Available	AUMs Required by WH&B **	Livestock Demand	AUM Deficit From Suita- ble Range
Ireteba Peak	1,327	816	1,546	1,035
	1,520 U			
Kyle Canyon	233 U	48	451	499
Roses Spring	647	84	Unallotted	--
	38 U			
Spring Mountain	1,535	720	Unallotted	--
	2,593 U			
Table Mountain	236 U	60	1,025	1,085
Wheeler Slope	1,279 U	60	Unallotted	60
Wheeler Wash	786	120	1,598	932
	274 U			
Nevada Division	16	36	Not grazed	20
of State Parks	142 U			
Lucky Strike *	165 U	24	1,516	1,530
Younts Spring	293 U	24	180	204

U - AUMs from areas unsuitable for domestic livestock (cattle) grazing

* - grazed by domestic horses

** - for numbers of animals to be managed for

the winter and out onto the flats and bajadas-drainages during the hotter months to be closer to a dependable water source at Lake Mead.

Local residents of Overton and Logandale and National Park Service personnel, who are familiar with the area, indicate the horses and burros stay yearlong within 5 miles of the area where they were inventoried (memoranda to files).

Burros in the Lower Meadow Valley-Moapa area tend to move up and down Meadow Valley Wash at random, apparently moving from forage to water and to other forage areas. No barriers, except fences around private lands, are present to prevent movement in this area.

Burros in the Gold Butte area (HMA 1) apparently do not migrate. The entire area is surrounded by natural barriers, fences, or the Overton Arm of Lake Mead. The burros move from the low hills, where they winter, onto the bajadas and flats near Lake Mead during the summer.

Distinct foaling areas are not evident in the Virgin Valley Planning Unit. The mares and jennies move away from contact with other animals to foal, and return 3 to 5 days later, after the foal is able to travel.

*** Opportunities: All the horses and burros in these areas appear to have ample living space, in and around each band's home range. However, in the Gold Butte-Grand Wash area, home ranges of individual bands appear to overlap to a high degree. More than adequate unoccupied area is available for the burros to move into.

The limiting factor for habitat expansion in proposed HMA 1 is water. Most of the burros in the Gold Butte area are found within 5 to 8 miles of Lake Mead, especially during late spring, summer, and early fall. Based on the number and appearance of trails, the burros move away from Lake Mead into the foothills of the low mountains to feed and for shelter. The fence north of Mud Wash could be removed to allow northward habitat expansion of the proposed HMA in Gold Butte.

Earthen reservoirs could be constructed in the foothills west of Lime Ridge (refer to base map). Water for the burros could also be obtained from the grazing permittees, who own the water rights to the many springs found in the Gold Butte and Azure Ridge allotments. Earthen reservoirs could also be constructed on the east side of Azure Ridge to furnish temporary waters for the burros.

A major problem could occur in the Muddy Mountains area which will affect the amount of available living space. See Habitat or Land Use Problems.

Stateline Planning Unit

Wild horses appear to utilize all the Spring Mountain foothills and Bird Spring Range yearlong. Horses have been observed in the snow at higher elevations during the winter while other bands have been sighted at lower elevations on the desert near Blue Diamond during the summer. Still other bands have been seen in Lovell Wash and near Bird Spring during the summer. The latter bands of horses tend to stay within 2 to 5 miles of water sources during the summer and range further in the same vicinity during the fall and winter.

No migration pattern is evident in any of the horse bands' territory, since the same bands of horses have been observed in the same or nearby areas throughout the year.

Foaling areas are not apparent in the Stateline Planning Unit. The mares appear to move away from the band to foal and return to the band when the foal is 3 to 5 days old and able to travel. Lone mares with very young foals have been observed in the same areas where horses are found.

Wild burros inhabit the lower mountain and desert areas of the planning unit. Burros have been observed from the lower limits of the juniper vegetation types into creosote flats at all times of the year. Burro use areas overlap those of wild horses in the Blue Diamond and Bird Spring Range areas, although burros are seldom seen at the same site with horses. Burros stay within 3 to 5 miles of water during the summer and move further away during the fall-winter seasons.

Burros do not appear to migrate and tend to stay in the same area for long periods of time. Trails are well-defined and show moderate to heavy use from water to feeding areas.

Burro foaling areas are not apparent. Jennies isolate themselves from other burros during foaling and return to the company of other burros after several days.

*** Opportunities: The wild horses/burros found in the Stateline Planning Unit appear to have ample living space, in and around each band's home range. More than adequate unoccupied area is available for the population to expand from the present areas of use.

The limiting factor for expansion of the area now occupied by horses/burros is the general lack of water throughout most of the habitat area. Several springs are found in the Eldorado Mountains (HMA 4) at higher elevations, but little use appears to be made of the area around the waters by burros, which stay near Lake Mohave and the Colorado River. Unappropriated waters could be piped down from the springs to the present burro use areas, thus improving the present range. Earthen reservoirs could be constructed to furnish water halfway between Lake Mead and the mountains where permanent springs are located, to expand the present range. Should the waters be fully appropriated, BLM can obtain a portion of the water and develop it for enhancement and expansion of the habitat.

c. Physical Characteristics

Virgin Valley Planning Unit

The horses observed during the 1979 inventory were of good size (1,000 to 1,100 pounds). All the horses appeared to be tall, solid, well-muscled, and in good flesh. These animals appear to be of quarter horse and thoroughbred ancestry. Colors, with one exception, a gray stallion, were dark, from dark sorrel (red) through bay, to dark brown. However, some of these animals may be domestic horses, authorized to graze the area under a current grazing permit. The number of horses observed was greater than is authorized to graze.

The burros observed in the Virgin Valley Planning Unit exhibit no outstanding characteristics which would distinguish this population from any other, with one exception. Three color phases were found in the Meadow Valley-Moapa area. Most are either black, or gray with stripes. During a roundup of problem animals in this area in 1976, however, a pale gray jack (male) with no dorsal or shoulder stripe, was captured. Although no animals this color were observed during the 1979 inventory, other solid gray animals could be found in the area. Herds in the Muddy Mountains-White Basin area and the Gold Butte-Grand Wash area contain only the black over white, and gray with black dorsal and shoulder stripes color phases. Both color phases are sometimes found grazing or watering at the same site. All the burros observed during the 1979 inventory or captured in 1976 appear to be smaller and weigh less than burros in similar terrain in Arizona and in the Esmeralda Planning Unit. Estimated weights of mature animals captured ranged from 350 to 450 pounds.

Stateline Planning Unit

All the horses observed during the 1979 inventory appeared to be of good size (900 to 1,100) pounds and exhibited a physical appearance characteristic of quarterhorse and thoroughbred breeds. The horses in the Spring Mountain area are taller and appear to be more trim than horses in other areas, probably due to the influence of stallions of the above-mentioned breeds being released to improve the bloodlines of horses running loose on the range, prior to the enactment of P.L. 92-195. Substantiated reports of stallion releases include quarter horse, thoroughbred, palomino, appaloosa, pinto, and percheron breeds (or color phases) in the Spring Mountain Range (both Clark and Nye Counties). Colors of horses observed during the 1979 inventory included white/gray, palomino, sorrel, chestnut, bay, brown, black, and pinto. The white or gray horses may exhibit appaloosa color characteristics, if examined closely.

The burros in the Stateline Planning Unit exhibit no outstanding characteristics which would distinguish the animals from any other population. Both color phases, black over white and gray with black dorsal and shoulder stripes, are found grazing or watering at the planning unit. At times, both color phases are found grazing or watering at the same site.

All the burros observed during the 1979 inventory or captured in 1976 appear to be smaller and thinner than burros found in similar terrain in Arizona and in the Esmeralda Planning Unit. Estimated weights of mature burros captured in 1976 averaged less than 400 pounds.

d. Habitat or Land Use Problems

Virgin Valley Planning Unit

The major problem for wild horses/burros is harassment by humans. Reports have been made of horses and burros being chased by ORV operators and/or horseback riders. Few of these reports have been substantiated, however.

Reports of burros being shot have been made in the past. However, no recent reports have been made. Investigations of past reports have been negative, due to the time factor and travel distance to the site of the incident.

Very little woodcutting occurs in this planning unit, and it does not affect the horses/burros. The animals move away from the noise and activity if at all possible.

The horses in the planning unit are not adversely affected by vehicle traffic at the present time. The horses are found at

mid-elevations on the east side of the Muddy Mountains and in burro-vehicle confrontations could occur. One road which leads through Gold Butte into Devil's Cove is extremely rough and vehicles must travel slowly. Burros can avoid the slow-moving vehicles. Although a road traverses Meadow Valley Wash, burros generally inhabit the rougher areas on either side of the drainage, coming into Meadow Valley Wash itself only for water.

In the Muddy Mountains, however, burro-vehicle confrontations are becoming more frequent, since a paved road transects burro travel routes to Lake Mead and the animals have become used to vehicular traffic. No burros have been killed or injured recently, but near-misses are becoming more frequent as traffic to Lake Mead increases. The airstrip at Echo Bay, in the Recreation Area, is a potential hazard to both burros and aircraft operators. The animals have become accustomed to all types of aircraft and could wander onto the airstrip during takeoff or landing operations.

Mining activity for precious metals is light in the Virgin Valley Planning Unit, and does not adversely affect wild horse/burro populations. Exploration/drilling for oil and gas in the Gold Butte and Muddy Mountains areas could have an adverse impact on burros and their habitat. Seismic operations have been conducted in both areas and the probability of oil and gas exploration drilling is high. Should oil and/or gas be discovered, the drilling operations and accompanying activities may have an adverse impact on the horses/burros and their habitat. Drilling operations will take land out of forage production as will the site for oil storage tanks and the roads and pipelines necessary to the oil production operations. In areas where both extensive and intensive petroleum/gas production is occurring, 5 wells per quarter-section and one storage tank group per section are common. A network of roads could be developed for maintenance purposes.

Increased vehicle operation could lead to increased horse/burro-vehicle confrontations. The disturbance could also cause the animals to move from their present area into a smaller area, thus decreasing opportunities for observation by the public. The exploration/production activity could also have an adverse effect on the breeding potential of the animals, from disturbance during breeding periods.

*** Opportunities: To prevent burro-aircraft collisions, the airstrip near Echo Bay should be fenced. BLM can cooperate with the National Park Service in the fence development and installation.

Should oil/gas exploration result in discoveries, construction of new roads in proposed HMA 2 could be limited to those absolutely

necessary to reach drilling location sites. Any roads to a "dry hole" site and the site itself should be plowed to prevent further use and allow rehabilitation. In most of proposed HMAs 1 and 2, adverse climatic conditions preclude artificial rehabilitation attempts.

The drilling locations and storage tank sites should be kept as small as possible. The well and storage tank sites should be fenced to prevent injury to horses/burros.

Reservoirs or catchments could be constructed in the foothills of the Muddy Mountains (HMA 2). A water well could be drilled in White Basin and the water piped out several miles to enhance the present horse/burro habitat. Development of water in the more remote areas of proposed HMA 2 could prevent many burro-vehicle confrontations by diverting burro travel routes, since burros move to Lake Mead for water during the late spring and summer months.

Stateline Planning Unit

The foremost problem for wild horses/burros in the proposed Spring Mountain HMA is human harassment. Reports of horses and burros being chased by ORV operators and horseback riders are received in the Las Vegas District Office periodically. Horses and burros have been reported to be shot. Past shootings (before the Wild Horse and Burro Act was passed, in 1971) were blamed on ranchers who reportedly wanted to eliminate competition from horses for forage.

Mining activity is light in the Spring Mountains and the horses and burros do not appear to be disturbed by this activity.

Very little timber harvest occurs in the planning unit. The only activity of this type is firewood harvest during the fall and winter, which is confined to selected areas in the Spring Mountains.

Horses and burros do not appear to be adversely affected by hunters. The animals move away from the disturbance and activity. Occasionally a horse or burro may be shot and killed by a hunter in error, but these incidents remain largely unreported.

Horses and burros have been and are still being affected by motor vehicle traffic. Horses and burros have been hit and killed along Nevada State Route 160 and U. S. Highway 95. The animals in the Spring Mountains have become accustomed to vehicular traffic and move across the highways, roads, and trails with little regard for motor vehicles, thus causing occasional collisions and death to the animal and damage to the vehicle.

The burros in the bands near the town of Blue Diamond pose quite a different problem. These burros scavenge the Blue Diamond garbage dump. The animals step in empty food cans and their hooves become trapped in the can. The bottom of the can then wears through as the burro walks, allowing the "barrel" of the can to slip over the hoof onto the lower leg of the animal. The can then begins to "crimp" on the bottom, from wear, turning inward, and causing lacerations about the pastern, corolla, and lower leg of the burro. Two burros have had to be destroyed because of extreme damage to their hooves and lower legs because of these cans. Burros have been captured and released after the cans were removed from their legs. Cans have been removed from three feet and legs of several individual burros. Many other burros have had cans on two feet or legs.

The burros around Blue Diamond and Mountain Springs have become accustomed to humans and come into town during the late evening. These burros cause damage by tipping over garbage cans and eating shrubbery. The animals are not afraid of pet dogs and wander through the town at will.

Unconfirmed reports of trapping and selling burros have been received by the Las Vegas District Office. The investigation of the alleged violations was negative.

Five burros died during the winter of 1979 of unknown causes. An autopsy was completed, but no poison or disease was found. Equine encephalitis was suspected, since some domestic horses located on the west side of Las Vegas were reported to have this highly communicable equine disease, but no conclusive evidence was found. All the burros were mature adults and apparently in good health before they were afflicted.

The horses and burros in the Eldorado Mountains are not adversely affected by ORV or mining use because of the few roads in the area. Since the Eldorado Mountains are uninhabited for the most part, violations of the Wild Horse and Burro Act are unreported. No vehicle accidents or shooting of burros have been reported from this area in several years.

Very few fences are found on BLM administered lands in any areas of wild horse and burro population in the Stateline Planning Unit. Most of the fences are around private lands or withdrawn areas. The few drift fences found in the planning unit, which limit cattle movement, have little effect on wild horse/burro movement. These animals are able to travel over steep rocky areas with relative ease.

*** Opportunities: Mining operations can be allowed, if present water sources used by wild horses/burros are not diverted from the use area or fouled by the operation. If mining operations should occur near or around a water source, the water should be piped away from the site, to furnish a source of water for the animals.

Grazing of domestic livestock can be allowed in the wild horse/burro areas, although direct competition for forage, water, and living space occurs. Livestock numbers should be reduced where the number of livestock and horses/burros exceed the carrying capacity of the available forage. Water sources should not be closed when livestock are off BLM administered lands, but left open for the horses/burros.

State Routes 160 and 59 should not be fenced. Both these highways transect the east side of proposed HMA 3 and a fence along either road would remove a portion of the habitat from use by the animals. Should animals be confined to the small area between Highways 59 and 160 and Las Vegas, survival chances would be very low, since no water and little forage is found in this small area. The horses/burros found to south of highway 160 could be cut off from water sources along the eastern edge of the Spring Mountain Range, if State Route 160 should be fenced.

Disturbance of horses/burros by ORV and other recreation uses can be reduced by limiting ORV use and camping in crucial areas (around permanent water sources used by the animals). No new roads or trails for ORV use should be developed or allowed in proposed HMAs 3 or 4.

Very little can be done by BLM to prevent burros from coming into the towns of Blue Diamond and Mountain Springs. The area is classified as open range by the state of Nevada and the responsibility to prevent movement of livestock and wild horses/burros into the area rests with private land owners. BLM has the responsibility to remove wild horses/burros from private lands, however, this responsibility does not extend to preventing movement of the animals onto or across these lands.

The landfill at Blue Diamond should be either covered daily with soil or fenced. The permit for the landfill does not specify fencing the area. To prevent a recurrence of the problem of cans on burros' feet in this and other areas, all permits of this nature should include the stipulation for mandatory fencing. This would prevent burros from scavenging and getting cans on their feet and legs.

e. Population Condition

Virgin Valley Planning Unit

The population condition of both horses and burros in this planning unit appears to be good. Horses were found only in the Muddy Mountains-White Basin area. Physical condition of these horses appeared to be very good. The apparent reason for the condition of the horses is the small population of these animals and the abundant water and forage resulting from the wet winter-spring seasons in 1979 and 1980. The horses have little competition from domestic livestock since few cattle graze in the area and then only in the late winter and spring.

Reproductive capacity of the horse population appears to be good to very good. During the 1979 inventory, two foals were observed and other mares in the breeding band appeared to be "in foal." However, no yearlings were identified in this band and only two other horses, both stallions, were seen in the area. No bachelor bands of immature animals were observed. The absence of young horses suggests that a periodic removal may be occurring, or that foal mortality is very high. The grazing permittee has a permit to graze domestic horses, but more horses were counted in the area than are authorized to graze.

Condition of burros in the Gold Butte and the Muddy Mountains areas appeared to be good. Many young animals were observed. Although competition for forage can occur between burros and livestock in the Gold Butte area, ample water is available from Lake Mead and the many springs found in the area.

Reproductive capacity of the burros in the Gold Butte and the Muddy Mountain areas appears to be good, based on the number of yearlings and young in the population during 1978 and 1979. The Gold Butte area was inventoried during both 1979 and 1980 and the reproduction rate (based on the number of yearlings inventoried both years) was 18 percent in 1979 and 20 percent in 1980, which indicates a higher foal survival rate than usual. This could be attributed to the abundant forage in the area during the past two to three years. According to studies and reports on burro life habits, female burros bear young every 16 to 18 months. Females do not rebreed until the current foal is weaned. Estrus cycles in burros are not seasonal, but can occur anytime during the year, after a foal has been weaned. Thus, burro foals can be seen during all seasons of the year.

The National Park Service has recommended removal of burros from the Gold Butte area. The animals are grazing lakeshore vegetation very heavily, and causing erosion damage that is highly visible from Lake Mead.

*** Opportunities: Very few opportunities exist for improvement of the populations of horses/burros in the Virgin Valley Planning Unit. Horses were observed only in proposed HMA 2, and local residents and National Park Service personnel indicate a small number of horses have occupied the area for many years. These horses are large and well-formed, with obvious quarter horse breed characteristics. Since these characteristics are not necessarily found in most wild horse populations, animals could be introduced from other proposed HMAs, adding to the gene pool. Should the horses be domestic, further grazing by these horses should not be authorized.

The burros in proposed HMAs 1 and 2 exhibit no special characteristics. The burros are similar in appearance to any other population of burros in areas outside Nevada.

Since the lower Meadow Valley Wash-Moapa area is an extension of the Meadow Valley Wash (Caliente) area, the burros in the Virgin Valley Planning Unit should be managed as part of the Caliente area. Livestock numbers should be reduced in proposed HMA 1, to eliminate competition between livestock and wild burros.

Stateline Planning Unit

The population condition of the horses in the Spring Mountains appears to be good. Three age classes were observed during the 1979 inventory. Some of the horses were alone, which indicates an older animal or a stallion whose harem has been taken over by a younger, stronger stallion.

The apparent reason for the good condition of the population in the Spring Mountains is the overall good habitat conditions. Most of the horses appeared to be in good flesh. The horses near Blue Diamond and near Cold Creek/Willow Creek have no competition for forage from domestic livestock and forage has been abundant for the last two years.

Horses are difficult to inventory in pinyon-juniper vegetation because the trees furnish escape cover and shelter. Few horses were observed in this vegetation type, although the Spring Mountains were flown thoroughly, on an overlapping grid pattern. All the horses observed were well below the snowline and most were in the vegetation ecotone between sagebrush and desert shrub.

The burro population also appears to be in good condition. The burros, however, as stated in the 1979 inventory, lack band integrity, with individual animals moving from band to band apparently at random. The apparent reason for the good condition of the burro population is overall good condition of the habitat

in the planning unit and the ability of the burros to utilize the rougher, rockier areas at low elevations.

Reproductive capacity of both the horses and burros in the Stateline Planning Unit appears to be good to very good. Young animals were observed in all but one band. Two lone female burros with very young foals were counted. These animals appeared to be returning to the company of other animals after having foaled.

Condition of burros in the Eldorado Mountains also appeared to be good. The average band size was 5 burros, with a range of one to nine animals in a band. Lone burros in this area were the exception, since all the bands except two contained 4 or more burros. All the burros observed in late April were in good flesh and had shed their winter coats.

Burros have little competition for forage from domestic livestock in the Eldorado Mountains area, and have abundant water from the Colorado River. Forage plants have been abundant for the last two years, 1978 and 1979, and should be even more abundant during the next year, due to higher than average summer precipitation in 1980.

Reproductive capacity appears to be good, based on the number of yearlings in the burro population. According to reports on burro life habits, females bear young every 16 to 18 months. Estrus cycles are not seasonal. Jennies rebreed after a foal is weaned, regardless of the time of year. Thus, burro foals can be observed during all seasons of the year.

*** Opportunities: Very few, if any, opportunities for improvement of the populations of wild horses/burros exist in proposed HMAs 3 and 4.

To increase the numbers of palomino horses in proposed HMA 3, no new stallions should be introduced into the population. Since the palomino color phase is a recessive genetic characteristic, the ratio of palomino horses should remain constant if no new animals are introduced. The population should be allowed to increase through natural selection to the carrying capacity of the proposed HMA.

The burros in proposed HMA 3 are smaller and thinner than animals in similar habitat in other parts of Nevada and in Arizona. This characteristic should be maintained and burros with different physical characteristics should not be introduced into the population.

f. Protection

Virgin Valley Planning Unit

The only town in this planning unit near which any burros are found is Moapa. The residents of this area are quick to report a sick, injured, or dead burro. The Gold Butte area is uninhabited for the most part, with use being by miners, recreationists, hunters, and livestock operators.

The major problems associated with law enforcement are the distance an officer must travel to the site of a violation and the general lack of witnesses. Very few violations are reported except burro-vehicle collisions. These incidents have been investigated by National Park Service personnel in the Muddy Mountains, and by local or state law enforcement personnel in other areas.

No organized ORV events have been authorized in any of the wild horse/burro areas in the Virgin Valley Planning Unit. Individual ORV use occurs, but few incidents have occurred, or have been reported, in the past several years.

Few fences are found in this planning unit. One allotment boundary fence, between Bunkerville and Gold Butte allotments, forms the effective northern boundary of a wild horse/burro area. Natural barriers and a fence in the Arizona Strip District form the eastern boundary of this same area. The burros could move around the fence on the northern boundary, but apparently do not. In the Meadow Valley Wash-Moapa area, fences are constructed around private lands and along a short segment of Nevada State Route 7, from Glendale toward Moapa. This fence extends only a few miles west of Glendale and does not extend into the wild horse/burro area.

The Union Pacific Railroad extends from Las Vegas through Moapa into Meadow Valley Wash and beyond. No reports of burro-train collisions have been reported, although the tracks extend into the Caliente Planning Unit.

Physical access into the wild horse/burro areas in the Virgin Valley Planning Unit is limited to the few existing roads, trails and washes. Most of the terrain in these areas is rough, rocky and steep, cut with numerous narrow steep-sided drainages, which make cross-country vehicle travel very difficult, at best.

Few fires have occurred in recent years in this planning unit. However, an active fire prevention and control program has limited fire damage to wild horse/burro habitat in other HMAs. The major damage caused by fire is destruction of forage and

cover, rather than injury to the animals themselves. The animals run away from fire and move quickly away from suppression activities, unless they become trapped. However, fire can be beneficial by removing undesirable vegetation species and allowing forage species to grow.

Few predators of horses/burros are found in the Virgin Valley Planning Unit. Coyotes are known to attack newborn foals, but the kill rate is unknown. Coyotes may attack extremely old and sick burros, but no confirmed reports have been made. Coyotes have been seen scavenging horse and burro carcasses.

*** Opportunities: Protection of wild horses/burros in the Virgin Valley Planning Unit may be improved by BLM personnel conducting irregular patrols through the HMAs in the planning unit. Sight of BLM personnel may deter acts which could take place otherwise.

Future landfills, which may be authorized under R&PP applications, should be fenced to prevent burros from scavenging and having cans lodge on their feet and legs.

ORV events should not be allowed in or around crucial areas in the proposed HMAs in this planning unit. Animals can be injured by collisions with vehicles, or become frightened and injure themselves in flight from the vehicle noise or movement.

Fences should not be constructed in the planning unit where access to water may be denied horses/burros. In the case where waters used by horses/burros may be fenced, water should be made available to these animals, away from the source.

Stateline Planning Unit

The residents of Blue Diamond, Mountain Springs, and Pahrump (located outside the planning unit) which are the only towns around which horses and burros are found, like to see most of these animals left alone. The burros are also an attraction for the private recreation area "Old Nevada". Winter visitors to the Colorado River/Lake Mohave portion of the Lake Mead National Recreation Area indicate the desire to see the burros in the animals' native habitat. Most of the residents of the Stateline Planning Unit are quick to report an ill, injured, or dead horse or burro, especially if within sight of a road or trail. Residents of Blue Diamond are also quick to report cans on burros' feet or legs. Members of the National Wild Horse Association, under BLM supervision, have captured and released burros in the area of Blue Diamond, after removing cans from the feet and legs of the animals.

A major problem with law enforcement is the general lack of witnesses to a violation. In incidents of collisions between burros and motor vehicles, investigations have been conducted by local law enforcement personnel.

Organizers of and participants in ORV events generally cause no problems to wild horses/burros. Very few, if any, organized events are authorized in a wild horse/burro area, at the present time.

Few fences or other barriers are found in the Stateline Planning Unit. However, most of the horses and burros are found in areas where most of the fences are around private lands, to prevent the animals from entering.

Access to most of the areas, except the Blue Diamond area, is limited to a few trails and washes. Observation of horses/burros by the public in other areas is limited.

An active fire prevention and control program has limited fire damage to horse/burro habitat and destruction of current years' forage production.

Few predators of horses/burros are found in the Stateline Planning Unit. Coyotes are known to attack newborn or very weak foals, but the loss rate of horses/burros to predators is not known. Coyotes may attack old and sick mature burros, but no confirmed kills of this nature have been reported or confirmed.

*** Opportunities: Protection of the wild horses/burros in herd management areas in the planning unit could be improved by BLM personnel conducting irregular patrols through these areas. This action may deter violations of the Wild Horse and Burro Act (P.L.92-195).

All authorized dump sites, such as the Blue Diamond sanitary landfill, should be fenced to prevent cans from lodging on the feet of burros. Efforts should be made to clean up other unauthorized dumping areas in the Spring Mountain area (HMA 3). Until the dump sites are fenced, the National Wild Horse Association should be allowed to remove cans from the feet and legs of the burros living around Blue Diamond.

ORV events should not be allowed in crucial areas in proposed HMAs 3 or 4. Events can destroy forage and can cause injury to the animals, either directly or in flight from the vehicle noise or movement.

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.45 Watershed

Overlays

Six overlays were prepared for each planning unit, showing watershed areas, erosion condition, erosion susceptibility, flood source and drainage areas, management opportunities, and watershed protection opportunities.

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Narrative:

1. Watershed Areas: Watershed areas were identified as part of Phase I of the Watershed Conservation and Development (WCD) program (BLM Manual 7322). Watershed area boundaries were drawn to conform to existing grazing allotments where practicable; some small allotments were combined. Grazing allotment boundaries were chosen to provide a common base, since grazing practices are often used as watershed management practices.

Those watershed areas bordering Lake Mead National Recreation Area end at the NRA boundary. All other watershed areas end at the Clark County line, except at the Clark County/Nye County boundary. Here, watershed areas cross the county line because the Stateline Planning Unit boundary formerly extended into Nye County.

The Virgin Valley Planning Unit is divided into 20 watershed areas, and the Clark County portion of the Stateline Planning Unit has 24 watershed areas. Phase I inventories of all of these areas were completed in 1972. The Watershed Areas Overlays and Tables .45-1 and .45-2 depict watershed areas and acreages.

2. Erosion Susceptibility: Soil surveys for Clark County were completed in 1979. Included in these surveys was a determination of the erosion hazard of each soil association. The erosion hazards are listed for each association in Section .33B, Soils.

Erosion susceptibility overlays were developed using information from soil surveys conducted by the Soil Conservation Service (SCS). Erosion susceptibility is a measure of erosion potential if the surface of a soil is disturbed. Wind and water erosion potentials are used in determining the erosion susceptibility of an area.

Erosion potentials for both water and wind are listed separately on the soil map unit descriptions in Section .33B, Soils, of URA 2.

Wind erosion potential is classified as low, moderate, or high. Soils with an SCS wind erodibility group rating of 1 or 2 are classified as high. A moderate rating is given to soils with a wind erodibility group rating of 3 or 4, and a rating of slight is given to soils with a wind erodibility rating of 5 or more.

Each soil also has a high, moderate, or low water erodibility rating. These ratings are derived from SCS soil survey field notes and a combination of the soil texture and slope. In general, if the slope multiplied by the K value* of a soil is 2.5 or less, the soil is in the slight erosion potential category. If the slope times the K value is between 2.5 and 7.5, the soil is rated as having a moderate erosion hazard, and values above 7.5 will place the soil into a severe category. It is emphasized that these break points are only general guidelines and are not the only factors used to place a soil in an erosion susceptibility class. For example, a soil with a slope times K value of 2.4 may be placed in either a slight or moderate erosion class depending on information provided in soil survey field notes. This soil would not, however, be classified as having a severe water erosion potential. (*The K value is taken from SCS soil survey field notes, and is based on soil texture and the amount of rock fragments. It is always less than 1.0. Soils with a high K value have a soil texture that is more erodible than one with a low K value.)

3. Erosion Condition and Trend: Erosion condition and trend data were compiled from the watershed inventory of the WCD program. Within each watershed area, vegetation subtype boundaries and representative homogenous areas within each subtype were identified. Transects were run in these areas, which allowed for the determination of a soil surface factor (SSF) to portray the erosion condition of the representative area (BLM Manual 7317, Erosion, and 7322.1). The SSF is a relative numerical value obtained by evaluating and rating up to seven categories of surface erosion features selected to portray the erosion condition of an area. In addition to finding the present SSF, the future SSF was also estimated assuming certain or no management changes.

The Clark County Range Survey was completed in 1979. This survey identified vegetation types in greater detail and also identified areas with critical SSFs, or found areas previously designated as critical no longer so. Revisions to the WCD data were made based on these critical areas. In doing so, boundaries of the WCD areas of representation were eliminated occasionally, therefore care must be taken when comparing the WCD printout data to the overlays or tabulations prepared in this section. The intensity of the range survey also made identification of relatively small areas with critical SSFs possible.

Where portrayal of these small areas was difficult or where survey data found critical SSFs on previously designated barren areas, the critical areas were not identified on the Erosion Condition Overlay or tabulations. Therefore, the total acreage identified as critical in this watershed discussion will not agree with that identified in the Range Survey data.

The erosion condition in Clark County ranges from slight to critical, with most of the county falling into the slight and moderate erosion condition classes. The Erosion Condition Overlays and Tables .45-3 and .45-4 show locations and acreages of the erosion conditions of the representative areas within each planning unit. These erosion condition classes are defined as follows:

Stable - There are no signs of soil movement. Surface litter is usually accumulating in place. Surface rock, if present, will be evenly distributed over the area. No pedestalling, rills, or flow patterns are apparent. Gullies may be present in a stable condition.

Slight - Some movement of soil particles and surface litter is apparent. Surface rock may be present but collection of small particles may be spotty. No pedestals are apparent. Rills less than $\frac{1}{2}$ inch deep occur at infrequent intervals of more than 10 feet. Visible flow patterns have been formed by surface water. Deposition of pavement particles may appear in flow patterns. Gullies may be present, but with little evidence of streambank or streambed erosion.

Moderate - Moderate movement of soil is plainly visible and recent. Moderate movement can be recognized by slight terracing caused by the accumulation of material deposited against litter, vegetation, or rocks. The terraces will generally be less than 1 inch in height. Moderate movement of litter is apparent. Some surface rock may be exposed in bare spots where fine soil particles have been recently removed by wind and/or water. Small rocks and plants on pedestals occurring in the flow patterns may be noticed. Small rills are apparent in exposed places. These rills will be between $\frac{1}{2}$ and 6 inches deep at intervals of approximately 10 feet. Sediment deposits are visible intermittently in flow patterns and against small obstructions elsewhere.

Critical - The soil mantle is in a critically eroded condition. Soil movement occurs with each runoff. Transported soil and debris caused by wind and water is deposited throughout the area against minor surface obstructions. Extreme movement of litter is apparent. Recent exposure of surface rock is common on gravelly and stony soils. Small rocks and plants on pedestals are generally evident and roots are exposed. Large rills are apparent on exposed areas. Flow patterns contain easily noticeable silt and sand deposits and alluvial fans. Actively eroding gullies are present on 10 to 50 percent of the area being considered.

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Severe - Subsoil is exposed over much of the area. Embryonic dunes and wind-scoured depressions may be evident. Only minimal traces of surface litter remain. Surface rock or fragments are dissected by rills and gullies. Most rocks and plants are pedestalled and roots are exposed. Flow patterns are numerous and readily noticeable, showing large barren fan deposits. Large rills are apparent on exposed areas at intervals of less than five feet. Actively eroding gullies are present on more than 50 percent of the area.

Soil erosion involves two processes: (1) a detachment or loosening influence, and (2) transportation by means of floating, rolling, dragging, and splashing. Freezing and thawing, flowing water, and rain impact provide the detaching agents. Raindrop splash and especially running water facilitate the carrying away of loosened soil. On comparatively smooth soil surfaces, the beating of raindrops effects most of the detachment.

During the high intensity, short duration thundershowers that are common in the region, raindrop impact tends to destroy soil aggregates, enhance sheet and rill erosion, and encourage considerable transportation by splashing. A hard crust often develops upon drying. This crust impedes seedling emergence, greatly reduces infiltration for the next storm, and limits the possibilities for vegetative shield which, by absorbing the energy of rain impact, prevents the loss of both water and soil and reduces degranulation to a minimum. However, in some desert locations, this surface crust does cover loose, fine soil particles, resulting in some limited protection from wind erosion. In the vegetation types offering generally sparse cover, little interception of precipitation or protection from overland flow of water occurs.

As is the case for water erosion, the loss of soil by wind movement also involves detachment and transportation. The abrasive action of the wind results in some detachment of tiny soil grains from the granules or clods of which they are a part. When the wind is laden with soil particles its abrasive action is greatly increased. The impact of these rapidly moving grains dislodges other particles from soil clods and aggregates. The cutting and abrasive effects, especially of sand, upon tender leaves and vegetation is harmful.

The causes of erosion vary with location. In the Virgin Valley area, where man's activities are not numerous, natural processes are the principal causes of erosion. In the Stateline Planning Unit, however, man's activities are much more common. Increased construction activities in the Las Vegas Valley and ORV use are major causes of surface disturbance. Typical areas around Las Vegas that are being disturbed are the Las Vegas Dunes area, Blue Diamond area, and the vicinity of Lake Mead NRA.

Livestock activities (trampling soils and intensive grazing of vegetative cover) is causing accelerated erosion in some high use areas, such as the vicinity of water sources and trailing areas. Also, wild burros are depleting vegetation in the Gold Butte area, which may result in increased erosion if population levels are not reduced (Combs 1981).

The best opportunity to improve the erosion condition in Clark County is to establish more low-growing vegetation (grasses) to reduce the speed and amounts of water involved in overland flows, and to offer greater wind protection. This will reduce soil movement, assist in litter accumulation, prevent large flow patterns, and reduce rill size.

4. Water Resources: Water quality problems in Clark County vary with location and type of water in question. The most common problem is the loading of sediments and dissolved solids into perennial streams and reservoirs.

Preliminary studies have indicated that ephemeral basin runoff and windblown materials from BLM administered lands in Clark County draining into the Colorado River System may cause an increase in total dissolved solids (TDS) at Davis Dam by .50 mg/l (basin runoff) and .72 mg/l (windblown materials) (USDI 1980).

The erosion on public lands is mostly natural. The low productivity of the land means little vegetal cover for soil stabilization, and consequently high erosion.

The influence of prominent land uses, such as grazing, mining, and ORV activity, on erosion rates has not yet been quantified on the Las Vegas District. However, it may be assumed that any disturbance of the soil/vegetal complex will influence the rate of erosion. This results from a variety of impacts, including compaction of soils, loosening of soil crusts or protective pavement, and removal of vegetative, litter, or rock cover.

The degree to which grazing animals affect erosion is related to the intensity of use. Low to moderate stocking levels have not been consistently demonstrated to either reduce or increase infiltration rates and the corresponding runoff rates (Gifford and Hawkins 1976, 1978). In areas of high concentration of animals, however, such as trails, water holes, and corral areas, compaction is more evident (Satterlund 1972). Computer programs designed to analyze the impacts of grazing on erosion document vegetative and litter cover removal as the most deleterious effect (Fogel et al. 1978).

In contrast, ORV impacts are not centered around vegetative and litter cover alone. Numerous studies have shown that ORV use, in some cases at low use levels, seriously affects rock cover, soil crusts, and desert pavement (Wilshire and Nakata 1976; Nakata et al. 1976; Sheridan 1979; Wilshire et al. 1980).

Disturbance to the range from cattle grazing is concentrated within one mile of water sources (Johnson 1978). The tendency of cattle to follow trails while travelling further reduces the amount of land disturbed.

The major chemical water pollution concern is the Las Vegas Wash and vicinity. The wash, once ephemeral, now carries wastewater from the Las Vegas and Clark County sewage treatment facilities into Lake Mead year-round.

Spring sources are commonly degraded by grazing animals (refer to the water quality discussion in Section .35, Water Resources) both physically and biologically. Physical evidence (feces) and simple numerical statistical probability suggest that most of the biological contamination is from livestock. In some high recreation use areas, such as the RRCRL, degradation by human activities is also possible. The State of Nevada Water Pollution Control Regulations (January, 1979) note that it is State policy to, among other things, "restore and maintain the chemical, physical, and biological integrity of water within this State." Water quality standards can be found in Table .35-8 and the Appendix of Section .35, Water Resources. Unrestricted mammalian access to springs, streams, and waterholes may be in violation of State water quality standards, particularly parts a, b, and d of Section 4.1.2.

Introduction of fecal material into waters will contribute to undesirable sludge deposits, floating debris, or possibly hazardous biological organisms. Trampling further reduces esthetic quality of the water.

Section .35, Water Resources, summarizes existing water information, including water yield data. No overlays or other tabulations were prepared for this water resource discussion.

5. Flood and Sediment Damage: Flood and sediment damage occurs throughout Clark County. Most damage on BLM administered lands is in the form of gully cutting and sheet erosion. Damage to State and private lands is much more severe, including damage to roads and highways, croplands, and residential areas. In some areas, loss of life has occurred.

During the period from 1905 to 1975, there were 169 damage-producing storms in Clark County. Accounts of these are found in the History of Flooding, Clark County, Nevada (USDA 1977). Most of the newspaper accounts deal with storms occurring in or near the Las Vegas Valley. The Flood Source and Drainage Areas Overlays indicate the locations of major source and drainage areas in Clark County. Table .45-5 lists types of damage and dollar value, when known, for selected years and/or storms.

The following narrative describes the location of areas damaged by flooding and the extent and type of damage incurred:

Damage Areas 1 and 2 (Upper and Lower Moapa Valley): Flood, water, and sediment damage have caused loss of agricultural lands, crops, railroad tracks, and roads and highways. Damage in varying degrees has occurred to homes, waterlines, irrigation canals, and fencing equipment.

Source area contribution appears to come from highly erosive, low production-potential BLM administered lands. Damage-producing storms occur almost yearly, however, high damage storms seem to occur at approximately 5-year intervals. Dollar damage values are not available for smaller isolated floods.

Damage Area 3 (Lower Virgin River Valley): Flood, water, and sediment damage have caused loss of agricultural land, crops, roads, and highways. Damage varies greatly from flood to flood on homes, waterlines, irrigation water intakes and canals, and farm equipment. Irrigation water intake and canal damage is probably the worst problem in this Damage Area as sedimentation and breaking of canal walls causes loss of entire crops. Source area contribution within the county is apparently the same as for Damage Areas 1 and 2. Other contributing source areas apparently causing greater damage are found in the upper reaches of the Virgin River drainage in Arizona and Utah. Damage-producing floods occur at about the same intervals as Damage Areas 1 and 2.

Damage Area 4 (South Point): Water and sediment damages occur to public and commercial facilities on the Nevada side of the Colorado River. Damage is caused when high intensity, short duration storms occur on the upper steep slopes of the contributing BLM administered lands. High intensity runoff is caused by the sparsity of native vegetation, by erosion pavement, and by the very shallow soils with limited waterholding capacity. Frequency of damage-producing storms is estimated to be about one every 5 years.

Damage Area 5 (Sandy Valley): Sediment damages occur to residential and agricultural developments on both the Nevada and California sides of Sandy Valley. High intensity storms produce the sediment from the source area. Damage-producing sediments are carried in the high intensity flows of water which carry the sand and silt particles off the slopes into the flatter farmland. During dry periods, the sands are moved by the wind back up onto the slopes. Damage frequency is estimated at 5-year intervals.

Damage Area 6 (Las Vegas Valley): Flood and sediment damages occurring in the Las Vegas Valley are extensive. Agricultural lands, industrial developments, commercial facilities, and public property have all been affected. Some loss of life has occurred. The most common cause of source area floods is short duration, high intensity storms of small areal extent. Other storms sometimes producing damage are general winter storms with low intensity rainfall over large areas, and general summer storms. Damage-producing storms occur on developed and undeveloped private land as well as on surrounding BLM administered land. Factors creating problems on BLM administered lands include low productive capacity soils, high percentages of silt sealing the soil surface, construction practices, and increased recreational use. Floods of small to moderate intensity have occurred almost every year with large damage-producing storms occurring at approximately 10-year intervals.

6. Water Uses: There are no significant water use requirements of the BLM watershed program in Clark County. No overlays or tabulations were prepared.
7. Problems: Principal watershed problems in Clark County include degradation of watershed erosion conditions, contamination of water sources by livestock or other mammals, sporadic flooding, and over-withdrawal of water supplies.

The vulnerable nature of desert soils makes it clear that disturbance to the protective desert pavement or vegetation will accelerate rates of erosion. Such disturbance will harm not only the productivity of the land, but will also increase rates of siltation of waterways and the sediment damage associated with flooding. Any activity increasing disturbance of the soil/vegetal complex will result in increased erosion. Disturbing activities include grazing, ORV use, and construction.

The widespread degradation of naturally occurring waters by trampling and fecal contamination is in apparent violation of state law. Also, in areas of high recreational use (RRCRL), consumption of contaminated waters has already led to hospitalization of recreationists (Van Der Puy 1979).

Flooding is fairly sporadic and is not severe in the Virgin Valley Planning Unit as compared to that in the Stateline Planning Unit. The Las Vegas metropolitan area is subjected to repeated flooding. Although the source areas are on BLM administered lands, the major cause of flood damage is the development within floodplains in Las Vegas itself (Weed 1980).

Serious water shortages are expected in the Las Vegas Valley by the year 2020 (State Engineer 1971), although these shortages may not affect the management of BLM administered lands. Throughout the county, there is sufficient groundwater available for livestock well development.

8. Opportunities: Management and/or treatment opportunities were identified by the Phase I Watershed Conservation and Development Program printouts.

No site-specific data are available related to the management opportunities presented in the Watershed Conservation and Development printouts. However, the objectives of the opportunities delineated on the Management Opportunities Overlays and summarized on Table .46-6 are stabilization of generally fragile soils, protection and/or enhancement of water quality and yield, and reduction of flood and sediment damages.

Management opportunities applicable to specific areas on the overlays are explained below:

Water Control: Opportunities for water control facilities have been identified on the overlay for specific areas of representation. These areas would provide some degree of improvement or protection from further deterioration for specific areas. Erosion reduction is possible through detention or diversion structures which would have the result of concentrating, dispersing, or channelizing water as needed for the particular target area objective. Water control practices for protection of roads and highways can generally be handled on a specific problem area basis. Widespread damage to these public facilities and lack of specific damage figures will require close coordination with the State Highway Department to provide needed structures in key areas.

Water control structures appear to be feasible only in a very small portion of the Virgin Valley Planning Unit. Structures would reduce erosion somewhat by detaining the water and sediments that are carried, until the structure was filled by sediments. Feasibility studies done by the Corps of Engineers, SCS, and Cooperative Extensive Service have shown that control of water is not feasible above the river channels as the high sediment loads carried by the water do not allow a long life expectancy for structures designed for normal water control. Cost-benefit ratios do not permit the type of structure needed to control water over an extended period of time.

The source area contributing to flood and sediment damage in the Las Vegas Valley in the Stateline Planning Unit offers the potential to reduce costly damage through the construction of large and extensive facilities. Feasibility studies by the Army Corps of Engineers and other agencies indicate opportunities exist that have as yet not been taken due to funding difficulties. Coordinated plans with other agencies could help prevent a major disaster in the rapidly growing Las Vegas Valley. Urban growth has obliterated old floodplains and channels, causing the expectation of extremely high losses of life and property in the event of a major flood originating on BLM administered lands. Water control structures to provide for diversion and detention appear to be viable alternatives. BLM opportunities to alleviate the flood and sediment problem in the Valley include coordinated floodplain management and stringent land disposal policies. Where 100-year floodplains within the metropolitan area are identified and are managed by the BLM, disposal of these areas for use as parks and open space would ensure the maintenance of beneficial floodplain functions.

Management: Management opportunity areas identified in the county are generally found in conjunction with other opportunities. Restricted use, and mechanical and chemical treatment in conjunction with management can be designed as complementary opportunities. Each of the other opportunities is a particular form of management. Reduction or prevention of erosion can be accomplished through management practices, generally using livestock as a management tool. Grazing systems management helps to establish better vegetative ground cover which reduces overland flow. Erosion and flood and sediment damage are reduced through this practice.

The following management opportunities were identified in Phase I of the WCD program, and apply only to those areas of soil, vegetal, and topographic suitability. These areas are indicated on the Management Opportunities Overlays.

Mechanical Treatment: The opportunity to improve watershed conditions through the use of mechanical treatment in conjunction with management practices would entail plowing or chaining to reduce the undesirable woody vegetation. This practice most often would occur on pinyon-juniper woodlands and would require seeding of such desirable ground cover plants as bunch grasses. All the benefits of increased ground cover, reduced overland flow, and reduced flood and sediment damages could be realized.

Chemical Treatment: The use of chemical treatment in conjunction with intensive management provides an opportunity to reduce woody, poor soil-protecting plants and release the soil moisture to the benefit of lower growing, better ground cover plants. The resulting soil protection could be enhanced through the management practices previously discussed, which would provide for better infiltration of moisture and reduced overland flows. The benefits of reduced erosion and sedimentation could also be realized through the use of the chemical treatment opportunity.

The present controversy over the use of potentially dangerous chemical defoliant makes controlled burning a viable alternative to the standard herbicides. Some opportunity areas could use fire as a treatment without harming the more desirable vegetation that presently exists in small amounts. Response to treatment would be the same as with other woody plant eradicators.

Maintain Natural Conditions: Much of the remainder of Clark County is not amenable to treatment. The lands are in a 3 to 4 inch annual precipitation zone and are characterized by soils which will not produce sufficient vegetation to protect the soil. These soils may be barren or nearly barren rock, dry lakes or playas, or infertile highly saline soils. The rocky areas and the playas can withstand considerable recreational use, but are wholly unsuited for houses or other construction. The saline soils are generally fragile areas, where any use will cause accelerated erosion.

Other Opportunities: In addition to the opportunities identified above, additional management activities can be made to address general water quality, and the water quantity problem.

Water Quality

Watershed Protection: Consolidation of the erosion condition and susceptibility data and overlays resulted in the identification of areas requiring protection from surface disturbance. This consolidation represents an up-to-date multi-parametric analysis which examines existing erosion conditions as well as potential erosion due to disturbance of the soil-vegetation cover complex. Protection of these areas will improve erosion conditions where needed and prevent disturbance of areas which have a high erosion hazard.

Included in the protective measures are limiting off-road vehicle use, eliminating or reducing grazing, and prioritizing fire suppression on certain areas, as shown on Table .45-7 and on the Watershed Protection Opportunities Overlays.

As described earlier, water quality is generally poor in naturally occurring springs in the county. Trampling and fecal contamination associated with cattle or other mammals is the principal cause. One opportunity to protect water sources is to fence off water sources used by cattle, diverting the flow via pipeline for use by cattle and wildlife nearby. This will help achieve the water quality standards set forth by the State of Nevada.

Contaminated waters are currently being used by recreationists, particularly in the RRCRL. Determination of the cause of contamination is necessary. Signs should be placed at contaminated waters in high recreation use areas warning the public against drinking the water.

Water Quantity: General measures can be made to improve water yield on a very limited basis. This involves spring or seep development, small water-harvesting catchments, and other techniques. Since these must be identified on a site-specific basis, consultation with a staff hydrologist should be made to utilize this opportunity.

A specific heavy metropolitan water use that BLM could assist in reducing is the extensive watering of lawns. By encouraging desert landscaping through sales of native vegetation, this use could also be reduced.

Fire Rehabilitation: Wildfires on the Las Vegas District create the risk of increasing erosion levels beyond acceptable levels, sedimentation of live streams and springs, and loss of soil productivity. Development of a comprehensive plan to ensure rapid rehabilitation of burned areas is necessary to protect the watershed resource. The need for a standardized rehabilitation plan for Clark County is exemplified in the effort to rehabilitate the 1980 Lovell Canyon burn, where coordination among the various District and State Office divisions resulted in implementation of this plan well after the 60-day action period specified in the BLM Manual.

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TABLE .45-1
Virgin Valley Planning Unit

WATERSHED AREAS

Name	Number	Total Acres	BLM Acres	Other Acres
Sunrise Mountain	108	30,771	28,951	1,820
Muddy Mountains	109	194,139	189,409	4,730
Dry Lake	110	65,361	64,642	719
Pittman Well	111	42,899	42,899	0
Arrow Canyon	112	97,071	97,071	0
Acton-Farrier	113	42,500	41,830	670
Ute	114	66,074	66,055	19
South Rox	115	45,160	44,227	933
Muddy River	116	22,932	22,397	535
Valley of Fire	117	32,370	31,650	720
White Basin	118	60,028	58,139	1,889
Mesa Cliff	119	17,161	17,161	0
Upper Mormon Mesa	120	48,556	48,496	60
Lower Mormon Mesa	121	43,798	43,518	280
South Toquop	122	26,559	26,559	0
Flat Top Mesa	123	23,011	23,011	0
Bunkerville	124	118,962	116,982	1,980
Hen Springs	125	26,676	26,596	80
Billy Goat Peak	126	47,354	47,193	161
Gold Butte	127	187,515	186,612	903
Totals		1,238,911	1,223,404	15,507

Source: Watershed Inventory, Phase I WCD Program, 1977.

TABLE .45-2
Stateline Planning Unit

WATERSHED AREAS

Name	Number	Total Acres	BLM Acres	Other Acres
Crescent Peak	010	122,539	119,408	3,131
Spring Mountains	085	254,420	248,219	6,201
Kyle Canyon	086	37,719	35,539	2,180
Lucky Strike Canyon	087	150,638	149,579	1,059
Cactus Springs	088	85,400	84,560	840
Wheeler Wash	090	138,240	137,080	1,160
Roses Spring	091	11,639	11,479	160
Younts Spring	092	23,200	23,200	0
Stump Spring	093	48,521	46,530	1,991
Black Butte	094	47,932	40,792	7,140
Table Mountain	095	86,541	84,272	2,269
Roach Lake	096	22,658	21,898	760
Jean Lake	097	126,295	125,395	900
Hidden Valley	098	63,766	63,636	130
McCullough Mountain	099	231,496	229,736	1,760
Ireteba Peak	100	197,187	194,057	3,130
Christmas Tree Pass	101	65,129	64,549	580
Newberry Mountain	102	33,814	33,654	160
South Point	103	22,041	21,881	160
Las Vegas Wash	104	26,000	24,640	1,360
Sludge Flats	105	27,400	26,420	980
Lone Mountain	106	23,840	23,220	620
Corn Creek	107	25,399	25,239	160
Mercury	128	27,120	26,909	211
Totals		1,898,934	1,861,892	37,042

Source: Watershed Inventory, Phase I WCD Program, 1977.

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TABLE .45-3
Virgin Valley Planning Unit
EROSION CONDITION AND TREND

Erosion Classification	Land Status			
	BLM Acres	Other Acres	Total Acres	Percent of Total
A. Condition (present)				
1. Stable	0			
2. Slight	512,749	4,016	516,765	42
3. Moderate	492,516	5,556	498,072	40
4. Critical	73,060	280	73,340	6
5. Severe	0			
6. Unclassified	145,079	5,655	150,734	12
Totals	1,223,404	15,507	1,238,911	100

B. Trend (projected)				
1. Downward (SSF decrease > 10)		X		
2. Upward (SSF increase ≥ 10)	17,706	X	17,706	2
3. Static (SSF change ≤ 10)	1,060,619	X	1,060,619	98
Totals	1,078,325		1,078,325	100

X = No trend estimate available.

Source: Watershed Inventory, Phase I WCD Program, 1977.
Revised 1980.

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TABLE .45-4
Stateline Planning Unit
EROSION CONDITION AND TREND

Erosion Condition	BLM Acres	Other Acres	Total Acres	Percent of Total
A. Condition (present)				
1. Stable	28,908	720	29,628	2
2. Slight	973,726	14,742	988,468	52
3. Moderate	710,967	13,462	724,429	38
4. Critical	35,891	6,478	42,369	2
5. Severe	0	0	0	0
6. Unclassified	112,400	1,640	114,040	6
Totals	1,861,892	37,042	1,898,934	100
B. Trend (projected)				
1. Downward (SSF decrease > 10)	3,729	X	3,729	1
2. Upward (SSF increase ≥ 10)	219,067	X	219,067	13
3. Static (SSF change ≤ 10)	1,526,696	X	1,526,696	87
Totals	1,749,492		1,749,492	100

X = No trend estimate available.

Source: Watershed Inventory, Phase I WCD Program, 1977.
Revised 1980.

TABLE .45-5
Clark County

FLOOD AND SEDIMENT DAMAGE

<u>Damage Area</u>	<u>Type of Damage</u>	<u>Source Area*</u>	<u>Dollar Damage Estimates</u>
1, 2	Flood, Sediment	A, B	\$ 100,000 (1960)
2	" "	C	13,000 (1966)
3	" "	D, E	307,000 (1966)
3	" "	D, E	86,000 (1969)
4	" "	F	- -
5	Sediment	G	- -
6	Flood, Sediment, Loss of Life	H	100,000 (1947) 380,000 (1954) 1,850,000 (1955) 170,000 (1957) 500,000 (1961)** 250,000 (1969)** 4-5,000,000 (1975)**

*Overlay symbols.

**Single event flood damage, all others are annual totals. Loss estimates from USDA (1977).

TABLE .45-6
Clark County
MANAGEMENT OPPORTUNITIES

Overlay Symbol	Treatment Opportunity	Stateline (Acres)	Virgin Valley (Acres)
Green SSF Numerals Only	Maintain Natural Conditions	1,275,315	598,747
Blue or Red SSF Numerals Only	Management	412,885	(79,458)
Any Color: M	Mechanical Vegetation Manipulation	80,097	898
C	Chemical Vegetation Manipulation	106,352	10,981
A	Watershed Tillage	- -	10,083
W	Water Control	82,193	26,612

TABLE .45-7

Clark County

OPPORTUNITIES FOR WATERSHED PROTECTION

SSF Class 1	Erosion Hazard	ORV	Protection Action	
			Grazing	Fire Suppression
Severe	High	1	3	4
Severe	Medium	1	3	
Severe	Low	1	3	
Critical	High	1	3	4
Critical	Medium	2	3	
Critical	Low	3	3	
Moderate	High	2		4
Moderate	Medium			
Moderate	Low			
Slight	High	2		4
Slight	Medium			
Slight	Low			
Stable	High	2		4
Stable	Medium			
Stable	Low			

Protective actions:

1. Restrict all recreational ORV use to roads and trails.
2. Restrict organized or multi-vehicular ORV use to roads and trails.
3. Change management of grazing animals in such a way that vegetative and litter ground cover increase by 25%.
4. Consider these areas as high priority fire suppression zones.

STATEMENT OF WORK

Item	Description	Quantity	Unit Price	Total Price
1	Item 1 Description	10	1.00	10.00
2	Item 2 Description	5	2.00	10.00
3	Item 3 Description	3	3.00	9.00
4	Item 4 Description	2	4.00	8.00
5	Item 5 Description	1	5.00	5.00
6	Item 6 Description	1	6.00	6.00
7	Item 7 Description	1	7.00	7.00
8	Item 8 Description	1	8.00	8.00
9	Item 9 Description	1	9.00	9.00
10	Item 10 Description	1	10.00	10.00

Notes: All items are to be delivered to the site. The contractor is responsible for obtaining all necessary permits and licenses. The contractor is also responsible for the safety of the work area and the surrounding community. The contractor must adhere to all applicable laws and regulations. The contractor must provide a detailed schedule of work and a list of personnel assigned to the project. The contractor must provide a detailed budget and a list of materials and equipment to be used. The contractor must provide a detailed plan of work and a list of personnel assigned to the project. The contractor must provide a detailed budget and a list of materials and equipment to be used.

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.46 Wildlife Habitat

A. Terrestrial Species - Mammals

Overlays

The following desert bighorn sheep overlays have been prepared for each planning unit:

Habitat and Migration Routes - showing yearlong, winter, potential yearlong, and potential winter habitats, and both current and historical migration routes.

Winter Concentration Areas - showing winter concentration areas.

Crucial Summer Habitat - showing current and potential crucial summer habitat.

Conflict Areas - showing conflict areas.

One other overlay has been prepared for each planning unit. The Mule Deer and Elk Distribution Overlays show current mule deer habitat, current elk habitat, important use areas for elk, and areas within deer and elk habitat serviced by water.

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Narrative

a. DESERT BIGHORN SHEEP (Ovis canadensis nelsoni)

The bighorn's inaccessibility due to the rugged terrain it inhabits, its adaptability enabling it to survive in a harsh desert environment, and the massive horn development of the rams all contribute to the majestic character ascribed to this animal. Indians in the Southwest were impressed by the sheep as witnessed by the number of bighorn appearing in petroglyphs in Nevada. In recent years admiration for desert bighorn has resulted in the formation of various interest groups, such as the Fraternity of Desert Bighorn and the Desert Bighorn Council, which have contributed time and labor for habitat improvement projects to safeguard the needs of the bighorn. The selection of the desert bighorn as the State Animal of Nevada also reflects its appeal.

The Nevada Department of Wildlife and BLM have cooperatively listed the bighorn as a sensitive species that warrants special management consideration similar to that afforded threatened or endangered species (BLM Manual 6840.31).

Population History

The desert bighorn arrived in the Southwest approximately 10-15,000 years ago. In Nevada, nearly every suitable mountain range probably supported bighorn. Prior to the arrival of white settlers the bighorn inhabited the Gold Butte, Virgin, Sunrise, Black, Muddy, Dry Lake, and Arrow Canyon Ranges and the southern portions of the Mormon and Meadow Valley Ranges. All are within the Virgin Valley Planning Unit in Clark County. Sheep also inhabited the Red Rock/La Madre/North Spring, Bird Spring, South Spring, McCullough, Highland, New York/Castle/Piute, River, Eldorado, and Newberry Ranges. These ranges are entirely or partially within the Stateline Planning Unit in Clark County. Portions of the Gold Butte, Black, River, Eldorado, and Newberry Ranges are on the Lake Mead National Recreation Area which is managed by the National Park Service (NPS).

The sheep migrated seasonally and annually between mountain ranges. These movements may have been in response to a lack of water sources in some ranges. Past and present migration routes between ranges are shown on the Bighorn Habitat and Migration Routes Overlay.

Sheep were eliminated from much of their historic range following the advent of white settlers. The bighorn were subjected to poaching and unregulated hunting. Domestic sheep and cattle overgrazed rangelands, competed for the use of water sources, and introduced new diseases to the bighorn. Miners set up their camps near springs and bighorn waters were usurped for mining activities (Russo 1956; Buechner 1960; Yoakum 1971).

Sheep populations reached their lowest numbers in the early 1900s. In 1901, they received protection from legal hunting by the State of Nevada, although poaching undoubtedly continued.

In June, 1979, 21 desert bighorn sheep were reintroduced into the southern portion of the Virgin Mountains. These sheep continue to use this area and have also moved south establishing residency in the Gold Butte Range. In June, 1980, 16 more sheep were reintroduced into the northern portion of the Virgin Mountains. These sheep have stayed in the vicinity of the release site. Five more sheep were released in August to supplement the sheep released in June.

Today, sheep are found yearlong on the Gold Butte, Virgin, Black, Muddy, Meadow Valley, and Mormon Ranges in the Virgin Valley Planning Unit. Sheep numbers fluctuate seasonally on the Muddy and Black Ranges since yearlong water is present, although limited, on the Muddies. While some sheep remain on the Muddies

yearlong, many migrate to the Black Range for the summer season and return to the Muddies in the fall.

The Arrow Canyon Range supports sheep seasonally. Although sheep have been observed on the range in July, no known yearlong water sources have been located in this range. Therefore, except in good precipitation years, the sheep move from this range to the Meadow Valley Range and to the Sheep Range (USFWS - Desert Game Range) for the summer months.

Historically, the Dry Lake and Sunrise Ranges were probably seasonal ranges, too. No known waters exist in these areas and no sheep use these ranges today.

In the Stateline Planning Unit sheep can still be found yearlong in all of the formerly occupied ranges. The distribution has been reduced from historic boundaries in some ranges, and migrations between ranges and portions of ranges have ceased due to increased human activity in the valleys. Highway and fenceline construction, livestock grazing, and mining activities have all hampered full use of available habitat.

Table .46-1 summarizes current sheep population estimates and projected reasonable numbers for each mountain range. The percent of county-wide current and projected populations supported by each range is also listed.

Table .46-2 evaluates current and historic bighorn ranges based on a subjective analysis of escape cover. Escape cover encompasses large expanses or is well distributed in excellent habitat. In fair habitat, escape terrain is scattered and/or limited.

Reasonable numbers are mutually developed by NDW and BLM as a statewide cooperative effort. Reasonable numbers are recognized statewide as the cooperative management commitment. As such, BLM will manage the current occupied habitats for the population levels known as reasonable numbers. The numbers are derived from an evaluation of habitat and population management potentials assuming other uses of the habitat are managed at a level that does not prohibit bighorn from making full use of the available resources. The Habitat and Migration Routes Overlays show current and historic sheep ranges in Clark County.

Population levels fluctuate slightly from year to year in each range in response to climatic factors. However, the long-term trend in sheep populations is stable in all but the Virgin and Gold Butte Ranges where an upward trend is anticipated following the reintroduction efforts. The potential exists for increasing sheep numbers in every range through habitat management.

Seasonal Use Areas

Yearlong Range (BY): The preceding section listed the ranges which support bighorn yearlong. Sheep are present in all or portions of these ranges yearlong, except Arrow Canyon. Sheep have been observed in Arrow Canyon Range in July, and in wet years this range can support sheep nearly yearlong. This range could be managed as yearlong.

In the Stateline Planning Unit there are 395,604 acres of currently occupied yearlong habitat (BY). The Virgin Valley Planning Unit contains 190,862 acres of currently occupied yearlong habitat. A total of 8,308 perennial AUMs and 2,394 perennial AUMs are available to bighorn in these areas, respectively. See Tables .46-3 and .46-4 for information on reasonable numbers, and acres and AUM data by range and allotment.

Total available perennial bighorn AUMs distributed throughout yearlong habitat will supply yearlong AUM demands of present population numbers in all but the River and Black Mountains (see Table .46-5). Since bighorn habitat on National Park Service land in the River Mountains was not surveyed, the shortage in this area pertains only to habitat outside Lake Mead NRA.

Discrepancies in these ranges may indicate the importance of annuals in the diet of bighorn, for although annuals are not allocated, they are used every year. Data from fieldwork conducted in the McCullough and Muddy Ranges support this conclusion (see Food discussion). In addition, seasonal movements in and out of these areas may reduce the actual AUM demand.

Through habitat development and concurrent bighorn population growth and extension, the potential exists for bighorn to reoccupy an additional 343,589 acres and 235,071 acres of historic habitat (BPY) in Stateline and Virgin Valley Planning Units, respectively. An additional 9,138 and 5,653 perennial bighorn AUMs are available in the Stateline and Virgin Valley Planning Units, respectively (see Tables .46-3 and .46-4).

Total available perennial bighorn AUMs will support reasonable numbers in only the McCullough and Eldorado Ranges in the Stateline Planning Unit and in the Mormon Range in the Virgin Valley Planning Unit.

The discrepancy between reasonable number AUM demand and perennial AUMs available (see Table .46-5) indicates the importance of the production of annuals in meeting bighorn

dietary needs and the importance of recognizing annuals as a resource to be managed, when available, for bighorn. Except in the McCullough, Eldorado, and Mormon Ranges, conflicts for ephemeral production may occur wherever livestock are grazing on an ephemeral license in bighorn habitat.

The discrepancy between AUM demand and availability may also reflect that forage production or condition is below potential. As a result, competition between bighorn and livestock is widespread.

Winter Range (BW): Winter range boundaries, acreages, and AUM summaries are identical to those of yearlong range. Arrow Canyon is the only current winter range that is not also considered a yearlong range. In Clark County, sheep are less restricted in winter than in summer due to greater water and forage availability. They are able to move into suitable habitat that lacks a water supply. Areas providing the most frequent observations of bighorn by Nevada Department of Wildlife (NDW) from October through April are identified as winter concentration (BWC) areas (see Table .46-6 and the Bighorn Winter Concentration Areas Overlays). The Dry Lake and Sunrise Ranges are unoccupied, historic bighorn winter ranges (BPW) (McQuivey 1978).

Winter concentration areas partially overlap with summer ranges in the Red Rock/LaMadre, McCullough, Highland, and Newberry Ranges in the Stateline Planning Unit and in the Black and Muddy Ranges in the Virgin Valley Planning Unit. Special attention should be given to assuring adequate forage allocations in these overlap areas.

Summer Range (BS): Summer ranges occur within yearlong ranges, around permanent water sources available to bighorn. Although the range size varies with temperature, forage condition, and temporary changes in water availability following rainfall, most sheep remain within two miles of available water in summer (Leslie 1977).

Every range in the Stateline Planning Unit contains summer range. In the River Mountains, however, all the summer range is within Lake Mead NRA. No allocation is made in this area. Since there is no livestock grazing, all AUMs are available to bighorn. In the Virgin Valley Planning Unit the Black, Muddy, Virgin, and Gold Butte Ranges are the only currently occupied ranges that consistently support sheep through the summer.

Since the sheep are restricted to areas within two miles of permanent water sources for four months in summer, there must be adequate forage in these areas to sustain the bighorn through this period. The availability of forage in summer range is also a limiting factor for bighorn.

In every bighorn range reasonable number AUM demands are not met by available AUMs within current crucial summer habitat when summer acre/AUM figures are applied (Table .46-5). This could be remedied by allocating all available perennial AUMs to bighorn in these areas and by denying licensing of ephemeral vegetation to livestock in crucial summer habitat. Developing waters and burning could increase carrying capacities in these ranges.

In the Virgin Valley and Stateline Planning Units, there are 48,772 and 95,533 acres of current summer habitat (BS) (see Tables .46-3 and .46-4). These acreages are all within two miles of permanent water sources bighorn are known to use in the summer. These waters are listed as crucial (C) bighorn waters in Table .46-7. In the Newberry Range, Pipe Spring (T.31S., R.65E., Sec. 1) may be used by sheep in summer in wet years but is not considered dependable in every summer.

If selected springs in bighorn habitat were developed to provide a yearlong water supply for bighorn which the sheep would use in the summer, the summer range of bighorn could be expanded tremendously. In the Stateline Planning Unit summer range could be expanded by 147,578 acres in current habitat and by 151,457 acres in historic habitat.

In the Virgin Valley Planning Unit summer range could be extended to an additional 19,852 acres in current habitat and to 109,858 acres in historic habitat. The springs that receive no known bighorn use in summer but could be used by bighorn in summer following spring development and subsequent habitat expansion are listed as potential crucial (PC) bighorn waters in Table .46-7.

It would not be necessary to develop all of the springs identified in bighorn habitat to expand summer range to the extent indicated above. Some sources are permanent and may receive summer use by sheep as their populations expand. Some sources are within two miles of other sources. In such cases, only a few of the springs would have to be developed.

Every summer range except the Highland, Black, and Muddy Mountains has adequate perennial forage to support current bighorn populations for four months, assuming there is no competition for space, water, or forage, and that forage on summer range is grazed only in the summer (see Table .46-5). Water developments and prescribed burning could increase carrying capacities in these areas, also.

The Arrow Canyon, Mormon, and Meadow Valley Ranges in Clark County do not have summer ranges at present. However, if the reasonable number of bighorn are to be sustained yearlong in

these areas, AUMs unavailable in summer due to a lack of water would have to be made available. This could be accomplished through development of big game guzzlers.

Water developments followed by bighorn reintroductions would be needed to reestablish sheep on the North Muddy, Dry Lake, and Sunrise Ranges.

Locations: Current yearlong (BY) and historic, unoccupied yearlong (BPY) ranges are shown on the Habitat and Migration Routes Overlays.

Current crucial summer habitats (BS) and potential crucial summer habitats in current ranges (BPS-C) and in historic ranges (BPS-H) are shown on the Bighorn Crucial Summer Habitat Overlay.

Bighorn winter ranges are identical to bighorn yearlong ranges; however, winter concentration areas (BWC) are shown on the Bighorn Winter Concentration Areas Overlay.

Food

Desert bighorn utilize a wide variety of plant species (Brown et al. 1977). Observations in southern Nevada indicate they use 130 plant species from 89 genera (Deming 1964). However, forage preferred by bighorn in southern Nevada comprises a much smaller list. Based on percent volume analysis from rumen ingesta of 61 bighorn, Indian ricegrass, squirreltail, desert needlegrass, and cheatgrass contributed 18.6%, 11.5%, 3.4%, and 0.4%, respectively. Nevada joint fir, mountain joint fir, little-leaved mahogany, and cliffrose provided 4.9%, 2.8%, 1.9%, and 1.0% of their diet, respectively. The most significant forbs were desert spurge and wild buckwheat, contributing 2.0% and 1.5%, respectively (Brown et al. 1977). These species are distributed throughout the creosote, blackbrush, and pinyon-juniper vegetation zones.

Generally, new growth of grasses, forbs, and browse as well as buds and fruits are utilized during the growing season which begins between December and April (Hansen 1960; Deming 1964; Brown et al. 1977). In mountains with a wide range in elevation, bighorn may move to higher elevations as new growth progresses upward in the spring (Bradley 1972). During summer and fall sheep can feed on dry grasses and browse unless local summer rains briefly provide new, lush vegetation (Deming 1964; Browning 1971).

Diets vary regionally and locally in the Southwest with changes in plant succulence and availability related to season, rain, and elevation (Barrett 1964; Yoakum 1966; Douglas and Norment 1977).

Many studies indicate grasses are preferred over forbs and browse (Bradley 1964; Yoakum 1969). Perennial grasses are common to all habitat types used by bighorn in the Southwest (Browning 1971) and are preferred over annual grasses that are less palatable and nutritious when cured (Bradley 1972; Hansen and Deming 1971).

While grasses may be preferred to forbs and browse in all seasons (Deming 1964), use of all three may vary seasonally. Forb use seems to be greatest in spring and/or summer (Barrett 1964; Wilson 1968; McQuivey 1978). Browse use increases as grasses become less available (Leslie 1977) and it may even receive more use than grasses if grasses are scarce (Russo 1956). Browse use decreases in summer when palatability is low. Conflicting reports by different researchers regarding seasonal preferences may be a result of working with small sample sizes, using different data collection methods, or sampling areas with differences in forage quality or quantity.

Information on present condition and trend is not available at this time although condition and trend transects were initiated in bighorn habitat in FY 80. Data on the food habits, diet quality, and forage competition among bighorn, burros, and livestock in the Muddy and McCullough Ranges have been collected and are being analyzed. Results of the analysis are not yet available.

Water

The amount of water available to bighorn is limited. Springs are found in the mountain ranges and on valley floors, and are recharged with mountain precipitation and underflows in bedrock. However, the springs are not evenly distributed and the flows fluctuate seasonally and historically. Natural and man-made catchments provide the only free water to wildlife in dry ranges.

Water is the most significant limiting factor for bighorn populations in southern Nevada. Water restricts the distribution of sheep in summer when water demand is greatest and available water is severely limited. Sheep numbers are restricted by the quantity of forage close to water since the remainder of the habitat is inaccessible due to distance from water.

All known waters in bighorn habitat in the Virgin Valley and Stateline Planning Units have been listed in Table .46-7. When known, the water is listed as a seasonal (S) or yearlong (YL) source. Waters in current yearlong habitat are listed as crucial (C) waters if the source is consistently yearlong and the sheep use the source in summer. Some waters flow yearlong but are not used by bighorn because the sources are shut-off or fenced-off. Other sources may receive more use if bighorn populations

increase. Cooperative agreements with present users could be developed to make water available to sheep where necessary.

The weather, condition of forage, and activity of the bighorn all influence how often bighorn will visit water sources (Weaver 1971). Lambs and ewes come to water every 10 to 15 days in the winter in Death Valley (Welles and Welles 1961), although waterholes are abandoned during cool seasons on many of Nevada's bighorn ranges (Hansen 1971a; McQuivey 1978). Succulent vegetation can replace free water temporarily (Welles and Welles 1961); but, summer temperatures dry up succulents. Also, as bighorn water requirements increase during the summer, a visit to a water hole every 3 to 5 days during the hottest, driest periods is necessary (Koplin 1960; Wilson 1968). Turner (1973) found that desert bighorn must drink at least 4 percent of their body weight daily in the summer in California. As a result, bighorn activity is restricted to areas close to water in this season.

Free water requirements may be high during spring, too. Ewes, in particular, may need free water when lactating in dry springs (Mahon 1971).

Water consumption is variable and hard to observe (Hansen 1971b). Consumption seems to vary with season, age, and location; and may range from 0.82 to 2.50 gallons daily (Johnson 1957; Koplin 1960; Hansen 1971a; Weaver 1971).

The wary nature of wild sheep may prevent them from using free water in bighorn habitat (Hansen 1971a). Presence of escape cover within several hundred yards of the waterhole, absence of other animals near the waterhole, and opportunity for unobstructed viewing of terrain in the vicinity of the waterhole may all be prerequisite to bighorn use (Hansen 1971a; Mahon 1971).

Cover

Bighorn sheep in the county occupy, or once occupied, the steep and rocky mountainous areas which provide escape routes from enemies and shelter from the elements. Shelters are usually rock overhangs, shelves, or caves. In areas occupied by sheep, the quantity and quality of existing cover is believed to be adequate.

Important Use Areas

Summer ranges, lambing habitat, and migration routes are important use areas.

Summer ranges for desert bighorn are considered crucial areas, that is, areas upon which the animal is dependent for survival and propagation. Bighorn movements are usually restricted to within two miles of water in summer due to the excessive heat and resultant high water demand. Sheep numbers in each range are limited by the availability of water and the quantity and quality of forage within two miles of water during the hot, dry summer season. Summer ranges are delineated on the Crucial Summer Habitat Overlay.

Lambing habitat is also crucial habitat for bighorn. Lambing usually occurs in rugged, precipitous terrain; areas with caves and overhangs are preferred (McQuivey 1978; Russo 1956). These areas provide protection from predators and harsh weather. Lambing habitat has not been delineated on an overlay since it is generally distributed throughout each range along ridges and canyons and in isolated outcrops. Lambing generally occurs in areas with greater than 50 percent slope.

Current migration routes are crucial habitat components, too. As man's activities have increased, many migration routes have been blocked for sheep. As a result, some sheep habitat has become inaccessible to the animals. Current migration routes must be protected or sheep numbers will decline. Fencelines, road developments, or improvements crossing migration routes should be modified if necessary to minimize impacts to bighorn.

Special Use Areas

The Desert National Wildlife Range, northwest of Las Vegas and administered by the U.S. Fish and Wildlife Service, is the only area in the state withdrawn and designated for bighorn sheep.

However, livestock water developments have been prohibited in the vicinity of the Highland Range. This area has been designated in the Highland Range Habitat Management Plan as bighorn crucial habitat and includes a portion of current bighorn habitat. The crucial habitat is delineated on the Bighorn Conflict Overlay.

Conflicts

Conflicts between bighorn and other resource users in sheep habitat are difficult to evaluate quantitatively. The amount of area other resource users encompass and the degree to which they affect bighorn vary in each range. As a result, land use was analyzed subjectively.

Livestock Conflicts: Many factors were considered when analyzing livestock-bighorn competition since livestock are often responsible for major problems or potential problems

confronting bighorn sheep in the District (see Table .46-8). Although forage in rugged escape terrain is not accessible to cattle, bighorn and cattle compete for forage on gentle slopes and in washes adjacent to escape cover and water sources. Competition for forage includes galleta grass (Hilaria jamesii), Indian ricegrass (Oryzopsis hymenoides), salina wildrye (Elymus salina), cheatgrass (Bromus tectorum), blackbrush and green-molly summer cypress (Kochia americana) (Wilson 1968), and is manifested by bighorn population densities that are lower in areas with livestock grazing than in areas without livestock grazing (McQuivey 1978).

Livestock competition is most severe during the dry, hot season (May through September) when both cattle and bighorn center their activities around permanent water sources that are essential to both species. Perennial and annual forage in the vicinity of water is of prime importance to both grazers at this time.

The first step in analyzing current livestock-bighorn conflicts involved consideration of the location of dry season livestock concentration areas. Conflicts are most severe where these areas overlap with crucial bighorn habitat.

Competition for water during both the dry and cool seasons warrants consideration, too. Competition for water may occur if the water source is accessible to livestock and within one mile of escape cover in bighorn habitat. Sheep may be reluctant to approach water sources when cattle are nearby, and, as a result, livestock concentrations near water may reduce bighorn use (Wilson 1968). Some water sources are inaccessible to livestock; so, the operator has piped the water to the livestock, eliminating all or most of the water at the source for bighorn. Other water sources are corralled, as in the Jean Lake allotment, preventing sheep use yearlong.

The number of livestock licensed to graze in bighorn ranges and the dates when grazing occurs are obviously important. As mentioned earlier, dry season conflicts are most severe since the animals are concentrated near permanent water sources. During the relatively cool season (October through April) cattle and domestic sheep can utilize lush vegetation in nearly any area accessible to them on the ranges.

The type of livestock grazing the range is important, too. Cattle are restricted from using some areas due to rugged terrain, but domestic sheep are less restricted. McQuivey

(1978) noted that no bighorn exist in areas presently grazed by sheep in Nevada. In Clark County, domestic sheep are licensed in bighorn habitat in the Virgin Mountains and in a very small portion of the Newberry Range.

It should be remembered that livestock and bighorn need not be in the same area in the same season to compete for forage. Livestock that graze a crucial area during the growing season can deplete the forage supply before the operator moves them elsewhere, leaving little forage for bighorn in the dry season when they must concentrate their activities near springs.

In every range there is a conflict with livestock for limited forage (Table .46-5). Livestock may compete for the use of perennials and annuals wherever they graze in bighorn habitat. Allocation of perennial AUMs to livestock beyond the competitive carrying capacities in all but the McCullough, Eldorado, and Muddy Ranges intensifies yearlong AUM shortages for bighorn reasonable numbers in current habitat. Livestock should not be granted preference on perennial vegetation in any bighorn habitat until all available AUMs are allocated to meet bighorn demand. Livestock should be licensed to graze only the ephemeral production that exceeds a minimum of 200 lbs/acre reserved as a wildlife habitat component. To deny licensing of ephemeral forage within crucial summer habitat would help alleviate the summer forage deficiencies. Piping livestock waters four miles from crucial bighorn habitat would drastically reduce bighorn and livestock overlap.

Areas and significance of bighorn/livestock conflict in livestock concentration areas are listed in Table 46-8. These concentration areas are the portions of bighorn habitat that receive relatively high levels of livestock use due to the availability of water and forage. Locations of conflicts are delineated on the Conflict Areas Overlays. Analysis of significant conflicts, by mountain range, follows.

In the Highland Range there is a shortage of perennial AUMs in the entire range to meet projected yearlong demand and to meet present and projected demand for bighorn in summer (Table .46-5). In addition, the bighorn winter concentration area overlaps with the bighorn summer range, increasing bighorn AUM demand in this area. Livestock concentration areas overlap bighorn summer habitat and winter concentration areas. As a result, the entire bighorn population is affected and conflicts are subjectively rated as high. To ease these conflicts, all available perennial

bighorn AUMs should be allocated to bighorn. There should be no ephemeral forage licensed to livestock within two miles of crucial summer habitat. Water should be piped four miles from crucial summer habitat around Highland Spring for livestock while protecting a yearlong supply at the source for bighorn. Similar action should be taken at Cow and Ora Hanna Springs.

In addition, domestic sheep grazed in the McCullough allotment in 1980 for the first time, causing conflicts due to the similar diets of bighorn and domestic sheep and the susceptibility of bighorn to diseases of domestic sheep. The sheep were not adequately monitored and as a result some sheep strayed onto bighorn habitat in Lake Mead NRA. For these reasons, domestic sheep should not be licensed in the McCullough allotment.

In the McCullough Range, bighorn and livestock compete for forage, water, and space south of McCullough Pass. There is an apparent abundance of forage but reasonable number demands cannot be met in the current summer habitat. Competition for forage exists around the three springs crucial to bighorn in summer: McCullough, Railroad, and Willow. These sources should be fenced to eliminate water at the source for livestock. Water could be piped away for livestock while assuring a yearlong supply for bighorn at the source. The pipeline distances should ensure the new sources are four miles from crucial habitat. This would alleviate the total overlap between crucial bighorn summer habitat and livestock areas that presently affects the entire bighorn population.

The restrictions on ephemeral licensing recommended for the Highlands should be applied to this range, also. Bighorn also winter in crucial summer habitat, accentuating the demand for bighorn forage in this area.

Livestock conflicts with bighorn are minimal in the Eldorado Range at present. Increased use of the Desert Queen Well by livestock may increase conflicts in winter. Water piped from this well should not be available within four miles of crucial summer habitat around Tule Spring if new conflicts in summer habitat are to be avoided. In addition, there is a shortage of perennial AUMs if the projected reasonable number of bighorn summer in the vicinity of Tule Spring. No ephemeral forage should be licensed for livestock within crucial summer habitat.

In the Newberry Range, available AUMs do not meet reasonable number yearlong and summer demands. Bighorn should be

allocated all available perennial AUMs, and livestock should be licensed only perennial forage in excess of bighorn demand. Domestic sheep are licensed in a portion of bighorn historic habitat. Since an effort will be made to extend current bighorn distribution into historic habitat, the grazing license should be changed to eliminate this overlap and the potential conflicts. Also, since the Newberry allotment has received very little livestock use in past years, the excellent historic bighorn habitat in this area should be placed into permanent non-use for livestock.

In the New York/Castle/Piute Range bighorn numbers are low and fluctuate, since the sheep move between Nevada and California. Livestock may compete seasonally for water at several springs important to bighorn in summer. The complete overlap between livestock concentration areas and crucial bighorn summer habitat indicates that conflicts are high. To eliminate spatial conflicts at the sources, water should be piped four miles away from crucial summer habitat for livestock while protecting a yearlong supply at the source for bighorn. To meet projected yearlong AUM demands, all available perennial AUMs in bighorn habitat should be allocated to bighorn. No ephemeral forage should be licensed to livestock within bighorn crucial summer habitat.

In the South Spring Range, there is a shortage of AUMs to meet projected bighorn summer and yearlong demand. Restrictions on livestock grazing in the New York/Castle Range should be applied here, also. This range could eventually support 10 percent of the county's bighorn population if reasonable numbers are attained. As a result, any livestock developments could cause serious conflicts. If Cave Spring is developed for livestock, water should be piped at least four miles from crucial summer habitat around Cave Spring while protecting a yearlong supply at the source for bighorn.

The Black and Muddy Ranges support 31 percent of the present bighorn population in Clark County. There are no conspicuous bighorn - livestock conflict areas. However, available perennial AUMs do not meet current or projected bighorn demand on summer range in these ranges (see Table .46-5). Present yearlong demands are not met in the Black Mountains. Ephemeral forage should not be licensed to livestock in bighorn crucial summer habitat in these ranges. As in all other ranges, 200 lbs/acres of ephemeral production should be reserved as a wildlife habitat component.

In the Virgin Mountains, Government, Red Bluffs, and Cabin

Springs are used by bighorn in summer. Yearlong water should be protected for bighorn at these sources and water for livestock should be piped four miles away from the crucial summer habitats around these springs.

Roughly half of the crucial summer habitat in the Virgin Mountains overlaps livestock concentration areas. At least 50 percent of the bighorn population in this range is affected by this overlap. Projected bighorn summer and yearlong AUM demands are not met in the Virgin Mountains. No ephemeral forage should be licensed to livestock in the current crucial summer bighorn habitat. Livestock should be licensed to graze only perennial production that exceeds the available perennial AUMs for bighorn reasonable numbers in current bighorn habitat.

In addition, domestic sheep have grazed in the Bunkerville allotment during the last two years. The route travelled by these sheep passes Red Bluffs and Government Springs - both crucial to bighorn. Because of the apparent conflict for forage, water, and space, and the susceptibility of bighorn to diseases of domestic sheep, domestic sheep should no longer be licensed to graze or trail in the allotments encompassing the Virgin Mountains (Bunkerville, Billy Goat Peak, Lime Spring, Mesquite Community, and Hen Springs).

In the Gold Butte Range water should be piped four miles from the crucial summer habitat around Garden Spring for livestock while protecting a yearlong supply for bighorn at the source. Projected AUM demands for bighorn should be met before AUMs are allocated or licensed to livestock.

Even if livestock are not allocated forage in the areas discussed previously, livestock will use the forage if water is available to them in these areas. Therefore, no new waters should be developed for livestock within four miles of any bighorn habitat with a shortage of AUMs for bighorn unless conflicts are prevented. Present livestock waters should be piped out of these areas. This will eliminate overlap of livestock and bighorn habitats, assuming livestock stay within four miles of available water sources.

To ensure free movement of bighorn through and between ranges, fencing should be kept to a minimum in bighorn habitat and along migration routes. Fences should be built or modified to wildlife specifications.

Potential conflicts between bighorn and livestock in historic habitats following reestablishment of sheep

populations are difficult to rate since new sheep distributions are based on conjecture. Little or no conflict would result in most areas. However, moderate conflicts could arise in the Newberry, North Spring, Virgin, and Gold Butte Ranges (see Table .46-2).

Horse and Burro Conflicts: The number of horses and the degree that horse and bighorn habitat overlap indicate competition is not considered to be serious at this time, except in the Bird Spring, South Spring, and Red Rock/LaMadre Ranges where bighorn and horses compete for water at Wilson Tank, Bird Spring, Lone Grapevine Spring, Mud Spring #2, and 99 Spring. These sources should be fenced to ensure yearlong water supplies for bighorn and to alleviate spatial and forage conflicts with horses.

Burro and bighorn diets are very similar; and, as a result, burros are a relatively greater threat than horses to bighorn. Although burros often stay in less rugged areas that are marginally adequate for bighorn, significant conflicts may exist in the North McCullough, Eldorado, Muddy, and Black Ranges, and may develop in the Gold Butte Range if the bighorn population expands. Potential conflicts following bighorn population expansion are considered serious in the Gold Butte Range because habitat overlap is believed to be much greater than inventories have indicated. Drought conditions or increased burro populations could increase range overlap and competition for food and water throughout the county. The National Park Service should be encouraged to fence Unnamed Spring in the Muddy Range to eliminate burro use and ensure yearlong availability of water for bighorn. They should also be encouraged to remove burros from the Gold Butte, Echo Wash, and Black Mountain areas. Remaining burro populations should be managed at the reduced levels.

The areas of bighorn and horse/burro habitat overlap, based on inventories since 1973, are listed in Tables .46-2 and .46-8. Areas are delineated on the Bighorn Conflict Areas Overlays.

Industrial Activities Conflicts: Since the 1800s, mining has been a part of southern Nevada's history. Miners set up claims and living quarters near water using the water for their mining activities and personal needs (Welles and Welles 1961). Bighorn discontinued or decreased use of these waters. Also, miners often poached sheep, contributing to the decline of bighorn populations (McQuivey 1976).

Mining operations in or adjacent to bighorn habitat can be detrimental to the sheep populations. The mining activities may force the sheep to avoid areas which may be valuable to them as lambing habitat, escape cover, or sources of food or water. Road development that accompanies mining can increase the chances of off-road vehicle activity and can increase sightseeing and hiking activities in the area, thereby adding to the potential for bighorn disturbance. The amount of habitat impacted by mining activities and the intensity of mining activities also influence the degree to which sheep are affected.

Today, mining activities have decreased in intensity on the District. Mineral deposits are present, but development is not economically feasible in many cases (USDI 1973a). Sand and gravel operations border present or historical bighorn habitat in the McCullough, Arrow Canyon, North Muddy, and Sunrise Ranges. In addition, many small individual claims are sporadically active, especially in the South Spring and Eldorado Ranges.

As economic factors change, mining activity may become prevalent in new areas (USDI 1973a). Nearly every range has potential. Oil and gas leases cover every range lying above the Overthrust Belt in the District. Impacts to sheep from oil and gas operations are similar to impacts derived from mining activities. Oil and gas exploration and development and new mining, sand, and gravel operations should be prohibited in the vicinity of lambing habitat in the lambing season and in the vicinity of crucial summer range yearlong. Summer ranges are too critical to bighorn survival to accommodate large-scale habitat degradation. All mining, oil, and gas operations should be required to effectively close roads in bighorn habitat which they have created or significantly upgraded, during periods of non-use and after completion of the project.

Powerline corridors and communication sites can be detrimental to bighorn, too, because they usually require service roads. These roads are often used by recreationists whose activities can lead to harassment of bighorn sheep if the roads enter their habitat.

Industrial land uses do not seem to create extensive problems for bighorn except in the Eldorado and South Spring habitats where individual mining claims are prevalent (see Table .46-2).

Recreational Activities Conflicts: Recreational impacts, harassment, and habitat degradation before 1900 were probably minimal; but, recent impacts have grown with increases in population and leisure time. Off-road vehicles (ORVs) are used throughout the District. Unorganized, noncompetitive ORV activity can occur in any of the mountain ranges.

Weekend ORV activity, including camping in remote areas, can lead to harassment and poaching of sheep, can keep bighorn away from waters, and can cause a loss of forage due to habitat destruction (Light, Weaver 1973; Jorgenson 1974; Berry K.H. 1980).

Permanent or long-term displacement results from continued use of areas or construction of permanent facilities in sheep use areas (Graham 1971). As a result, Light and Weaver (1973) recommend closing key areas to mineral entry. Visitor days in crucial summer areas should be limited to 500/summer season to avoid long-term displacement (Light and Weaver 1973) since heavy use will keep sheep out of areas in line-of-sight of human activity. Target shooters and ORV enthusiasts on logging roads have reduced sheep use in adjacent areas.

Temporary displacement can result when hikers, campers, horseback riders, motor vehicles, and/or dogs move into an area (Graham 1971). The sheep are often spooked by the sudden encounter or are, less often, chased or shot. Such encounters can stress sheep by keeping them away from water; can stress pregnant or lactating ewes causing abortions or abandonments, or can force ewes from lambing habitat.

Prolonged or frequent camping, horseback riding, or ORV activity can permanently displace sheep and cause habitat trampling and destruction. Off-road vehicle use will also destroy habitat.

Light and Weaver (1973) recommend that summer recreation travel should remain outside and out of sight of crucial summer habitat; cross country travel should be discouraged during lambing season; recreation developments should be discouraged in key areas; seasonal restrictions should be placed on construction in portions of sheep habitat; and vehicle use should be confined to existing roads.

Competitive ORV events occur within or adjacent to several current and historical ranges. Competitive ORV events are creating significant conflicts with bighorn in the Highland, McCullough, Eldorado, New York/Castle/Piute, Bird Spring, and South Spring Ranges (see Table .46-2).

Because of the potential for harassment of bighorn and for habitat destruction, individual ORV use should be restricted to existing roads, trails, and washes in current bighorn habitat. Competitive ORV events should be prohibited seasonally in specific portions of bighorn habitat. Competitive events should be prohibited May 1 through September 30 in crucial bighorn summer habitat; January 1 through April 30 in the vicinity of lambing habitat; and throughout bighorn habitat during the hunting season, generally mid-November to mid-December. No competitive events should be allowed in historic bighorn sheep range for three years following reintroduction of bighorn into these ranges. The remainder of bighorn habitat should be open to competitive ORV events along existing roads, trails, and washes only during the hot summer months when sheep are restricted to crucial summer habitat.

If the Air Force develops a base in Coyote Spring Valley, ORV activity in the Arrow Canyon and Meadow Valley Ranges could increase tremendously. If the base is developed, recreational ORV use in these bighorn areas and along the local migration routes should be prohibited.

Few picnicking and/or camping areas are developed except near highways and in the Las Vegas vicinity (USDI 1973b). Such developments are usually located adjacent to water sources. They exclude bighorn use of some waters in the Spring, South Spring/Bird Spring, and Muddy Ranges. Such developments also exist at historical bighorn waters in the Gold Butte and Virgin Ranges.

One area within the District has been developed as a large scale recreation area. The Red Rock Canyon Recreation Lands encompass all but the northern end of current bighorn range in the Spring Mountains. Several important bighorn waters can be approached by vehicle. Picnicking occurs at several other waters that are accessible to hikers. In the future, a horse trail and primitive campsites may be constructed adjacent to excellent escape cover for sheep.

To reduce the unavoidable impacts of picnicking, camping, hiking, and other activities on bighorn in designated recreation areas, roads, trails, and campsites should be kept 1/2 mile from LaMadre and White Rock Springs and Brownstone Reservoir in the Red Rock/LaMadre Range, and from Unnamed Spring in the Muddy Range.

In summarization, conflicts between bighorn and other resource uses have been discussed in this section. All uses create

conflicts to varying degrees in different bighorn ranges. Specific uses creating high or moderate conflicts with bighorn warrant immediate attention to resolve the problems. However, a subjective analysis of the cumulative impacts of all uses in each mountain range helps to categorize the ranges according to overall conflicts with bighorn (Table .46-2). Hopefully this table will help the manager address the problems described above.

Harvest

Sheep tags are issued for trophy hunting on every mountain range in the county except in the Highland, Virgin, and Gold Butte Ranges. The Highland Range was closed after 1978 to shift hunting pressure to the McCullough Range in the same hunting district. The sheep populations in the other two ranges could not survive hunting pressure at this time. Table .46-9 summarizes sheep harvests for the last five years.

Nonconsumptive Uses

Bighorn released in the Virgin Range are being monitored daily during the summer seasons and will be located on a regular basis through the next several cool seasons. This cooperative project conducted by BLM and Nevada Department of Wildlife will provide insight into the needs of bighorn, the potentials for habitat enhancement, and the important factors governing the success of reintroduction efforts.

A study of bighorn diet quality and of bighorn-burro and bighorn-livestock diet overlap is nearing completion in the McCullough and Muddy Ranges. Additional work is needed in this field to improve the ability to intensively manage the use of the forage important to all grazers in the District.

Habitat Loss or Change

No habitat losses have occurred in recent years. However, the arrival of settlers in the 1800s and the subsequent growth of natural resource use by man in southern Nevada resulted in the departure of sheep from presently unoccupied historical habitat.

Development of the operation base in Coyote Spring Valley for the MX system could have significant impacts on bighorn sheep. Increased activity, including vehicular traffic on U.S. Highway 93 and State Highway 7, could eliminate migration to and from the Arrow Canyon Range. Since no known yearlong water is available to bighorn in this range, more than 54,500 acres of excellent bighorn habitat could become unavailable. If sheep were still able to use the range, increased human activity related to MX operations in the valley and related to recreation activities by

employees could increase harassment of bighorn. This additional stress could reduce sheep numbers in the Arrow Canyon Range.

*** Opportunities for Habitat Improvement, Expansion and Protection

Increasing sheep distribution may require reintroduction of sheep into several historic, unoccupied areas. Another reintroduction into both the Virgin and Gold Butte Ranges would accelerate reestablishment of bighorn populations in both ranges, and should have first priority, as agreed by BLM and NDW (Janke 1979). Bighorn releases will be needed to reestablish sheep in historic range in the McCullough, Bird Spring, North Spring, Muddy, Sunrise, and Dry Lake Ranges. These reintroductions should receive lower priority (Janke 1979) since escape cover is rated as only fair.

To ensure that bighorn populations can expand in numbers and distribution, all available perennial bighorn AUMs should be allocated to meet bighorn reasonable number demands in current habitat and projected bighorn demands in historic habitat.

Improvement of seasonal springs, development of natural or man-made catchments, and modification of some livestock water sources in bighorn habitat is needed. Such projects will increase water and forage availability in summer for sheep and will allow bighorn populations to increase in size and distribution. Bighorn numbers could increase to 3,462 and 1,199 in the Stateline Planning Unit and Virgin Valley Planning Unit, respectively, if bighorn used all available perennial forage in current habitat yearlong. Numbers could increase to 7,269 and 3,554 in the Stateline and Virgin Valley Planning Units, respectively, if all available perennial forage was utilized in historic habitat as well.

Habitat Management Plans (HMPs) should be developed and implemented for every bighorn area. Such plans have been completed for the Highland, Red Rock/LaMadre, and Mormon Ranges. A plan for the Virgin Mountains is being drafted in FY81. The Highland and Red Rock/LaMadre plans should be updated, revised, and implemented. Mountain ranges that should take top priority for new management plan development have been identified by NDW and BLM and include the Virgin Mountains, Gold Butte, Arrow Canyon, Muddy, Meadow Valley, McCullough, South Spring, Bird Spring, Newberry, and Eldorado Ranges (Janke 1979).

The Federal Land Policy and Management Act (FLPMA) requires BLM to designate Areas of Critical Environmental Concern (ACEC) and provide special management attention to these areas. According to the ACEC Policy and Procedures Guidelines (June, 1980) the elements of wildlife habitat that the species requires "to

normally and naturally maintain a healthy life and perpetuate its population" can be considered ACECs. These elements include important or critical habitat of sensitive species such as desert bighorn (BLM Manual 6840.3).

Since bighorn summer habitat, lambing habitat, and migration routes are considered critical habitat components these areas should be nominated as ACECs. Management recommendations to reduce conflicts with other activities as presented in this text should be adopted and implemented in these areas. Although all critical habitats should be nominated, the following ranges should be given top priority in the order listed, based on analysis of current and anticipated conflicts: Arrow Canyon, McCullough, Highland, Red Rock/LaMadre, Muddy, Bird Spring, Eldorado, Virgin, and New York/Castle/Piute.

Vegetation shortages for reasonable numbers of bighorn can be alleviated by water development, restrictions on livestock grazing, and adoption of fire management plans. Water developments would provide additional forage for summer use, providing additional perennial AUMs to meet reasonable number demand. Restrictions on livestock licensing, i.e., allocating to livestock only after all available perennial bighorn AUMs are allocated to bighorn, licensing to livestock only the ephemeral AUMs that exceed 200 lbs/acre, and denial of all licensing of ephemeral vegetation to livestock in crucial summer habitats could ease AUM shortages for bighorn. Piping livestock waters four miles from crucial bighorn summer habitat while leaving some water at each source for bighorn would drastically reduce bighorn and livestock overlap. Domestic sheep licensing could be discontinued in the McCullough, Bunkerville, and Billy Goat Peak allotments and new dual-use requests could be denied.

Prescribed burns and firewood sales in pinyon-juniper areas in the McCullough, South Spring, Red Rock/LaMadre, and Virgin Ranges should be considered. The plans should apply to unintentional fires in any bighorn habitat. Plant succession in burned areas should increase grass production. This would be very beneficial throughout bighorn habitat.

Fenceline modifications can reduce restrictions on sheep movement. For example, modifying the Billy Goat Peak - Gold Butte fenceline to wildlife specifications will reduce the impairment to bighorn migrations. In addition, fencing water sources used by horses or burros with wildlife fences will force a redistribution of these animals away from bighorn habitat. This would be beneficial in the Red Rock/LaMadre, Bird Spring, and South Spring Ranges. Horses and burros should be removed from current and historic bighorn habitat.

Oil and gas exploration and development and new mining, sand, and gravel operations should be prohibited within crucial lambing habitat in the lambing season and within crucial summer range yearlong. Summer ranges are too limited and critical to accommodate large-scale habitat degradation. All mining, oil, and gas operations should be required to effectively close roads in bighorn habitat which they have created or significantly upgraded, during periods of non-use and after completion of the project.

No new, permanent roads or trails should be established in crucial bighorn summer habitat. Road development may force sheep to avoid crucial cover, forage, and/or water resources.

Because of the potential for harassment of bighorn and for habitat destruction, individual ORV use should be restricted to existing roads, trails, and washes in current bighorn habitat. Competitive ORV events should be prohibited seasonally in specific portions of bighorn habitat. Competitive events should be prohibited May 1 through September 30 in crucial bighorn summer habitat; January 1 through April 30 in the vicinity of lambing habitat; and throughout bighorn habitat during the hunting season, generally mid-November to mid-December. No competitive events should be allowed in historic bighorn sheep range for three years following reintroduction of bighorn into these ranges.

To reduce the unavoidable impacts of picnicking, camping, hiking, and other activities on bighorn in designated recreation areas, roads, trails, and campsites should be kept 1/2 mile from LaMadre and White Rock Springs and Brownstone Reservoir in the Red Rock/LaMadre Range, and from Unnamed Spring in the Muddy Range.

If the Air Force develops a base in Coyote Spring Valley, ORV activity in the Arrow Canyon and Meadow Valley Ranges could increase tremendously. If the base is developed, recreational ORV use in these bighorn areas and along the local migration routes should be prohibited.

b. MULE DEER (Odocoileus hemionus)

Population and Life History

Mule deer populations in Nevada are believed to have been relatively low prior to the turn of the century. Unregulated livestock grazing prior to 1934, and logging and wildfires resulted in the transition of grassland communities to mountain shrub communities. The increase in browse-type plants favored deer populations which peaked during the 1950s. Populations declined sharply from that time, reaching a low point around 1967. Population trend for mule deer in Clark County appears to be stable in all ranges except for the Virgin Mountains, which show an increasing trend.

The mule deer usually breeds from late October to the end of November. The gestation period covers approximately seven months, and fawning begins sometime in June. Does usually breed at 16-18 months of age, with young does usually producing single fawns. Twinning is more common among older does. Condition of the range determines the amount of twinning that will occur and the number of younger does that will fawn. Weaning lasts for about three months. Availability of suitable green forage is critical to fawn survival. Young bucks abandon their mothers at 9-12 months of age; young does remain longer. Deer groups are smallest in summer. Deer seldom live beyond 10 years in the wild. The life expectancy of bucks is considerably less than that of does.

The distribution of mule deer in Clark County is extremely limited because of the lack of suitable habitat throughout most of the area. "Historic evidence in the form of archeological records and documented sightings suggests that mule deer are distributed in much the same general areas today as they were historically. It is suspected that while numbers of deer in the region have fluctuated on a periodic basis due to changes in habitat conditions, the distribution has not significantly changed" (NDW February 1980).

Mule deer habitat, present population estimates, reasonable number estimates, total present forage capacity for deer, and the amount of forage needed to satisfy reasonable numbers is summarized in Table .46-10.

Seasonal Use Areas

All the areas used by mule deer in Clark County are considered yearlong range and are delineated on the Mule Deer and Elk Distribution Overlay.

Food

Existing forage condition and trend data for Clark County, as it applies to mule deer, is not available. Tables .46-11 and .46-12 indicate how much forage in deer ranges is available to mule deer, by grazing allotment.

Deer eat many plant species with preferences changing with the season of year, growth stage of plants, and other factors.

Pudney (1972) found that sagebrush and grasses were preferred species in the summer diet. Chokecherry, bitterbrush, and serviceberry were preferred summer browse, collomia and geranium were preferred summer forb species. Browse provided better than 90 percent of the winter diet.

Yearlong, browse species dominate the diet. All major forage species except sagebrush are used most when crude protein and phosphorus levels are high and the crude fiber level is low (Papez 1976). A stomach analysis by major food categories of 80 deer from the Ruby-Butte deer herd shows the following seasonal diet composition (Pudney 1972).

<u>Season</u>	<u>Number</u>	<u>Grass</u>	<u>Forbs</u>	<u>Browse</u>	<u>Unknown</u>
		<u>(Percent by weight)</u>			
Spring	44	25.2	8.2	65.1	1.5
Summer	22	2.0	15.6	80.9	1.5
Winter	14	1.2	3.8	94.9	0.1

Studies from northern Arizona in vegetation that more closely approaches that in Clark County indicate that cliffrose, Gambel's Oak (both leaves and mast), desert ceanothus, and Wright's silktassel are important browse species for deer. (Swank 1958; McCulloch 1969; Reynolds et al. 1970).

Water

An adequate water supply is a vital ingredient of all deer ranges. Temperature, evaporation, water content of forage, and exercise all influence the quantity of water utilized. Water is most often a limiting factor in arid regions where yearlong water is scarce. The need for drinking water diminishes with increased availability of succulent vegetation, however, a study in southcentral New Mexico concluded that deer are dependent upon free water and travel a maximum distance of 1.5 miles from water (Wood et al. 1970). Studies in Arizona indicate that mule deer watered at least twice daily and consumed an average of 6.3 quarts per drinking period (Elder 1954).

Presently, portions of all the mule deer ranges in Clark County lack sufficient yearlong waters to allow optimum utilization of the entire habitats by deer. The Mule Deer and Elk Distribution Overlay indicates the deer habitat serviced by yearlong water, and the habitat in which potential mule deer use could be increased by providing yearlong water either by improving seasonal waters or by installing guzzlers (man-made water-collecting devices).

Cover

Protective cover is especially important in influencing deer distribution in midwinter, at fawning time, and during hunting seasons. In the absence of severe climate and of predators, deer appear able to survive with a minimum of cover. Cover can be provided by topography as well as vegetation. Deer prefer edges of vegetation types (Dasmann 1957, 1971). According to Richens (1967) in northeastern Utah, the heaviest use of sagebrush was generally within one-quarter mile of pinyon-juniper or other escape cover. Any improvement of cover for deer should aim to create interspersions of food, water, and cover within a short radius, preferably about one-half mile (Dasmann 1957).

Important Use Areas

Deer are primarily an invader species of wildlife that depend on vegetation changes in order to reach maximum population levels (NDW February 1980). Recently burned habitat that has not reached climax condition is considered important habitat, and recently burned habitat that is within 1.5 miles of yearlong waters should be considered especially important.

Crucial Areas

Crucial areas for mule deer in Clark County have not been determined. No information has been gathered relating to such areas.

Special Use Areas

No areas have been withdrawn or especially designated for deer use.

Conflicts

One of the major conflicts associated with deer management on the Spring Mountain Range is the continued maintenance of climax vegetation communities by means of suppressing wildfires. Complete protection of vegetation communities from natural forces such as wildfire prevents deer populations from expanding and reaching maximum levels of abundance (NDW February 1980).

Increased public use in portions of the Spring Mountain Range also causes a conflict in some areas. The development of the Lee Canyon ski facilities, for example, displaces wildlife habitat. Development of campgrounds, summer homesites, and other facilities also has an adverse effect on all wildlife populations in the area (NDW February 1980).

Heavy livestock grazing and/or wild horse or burro use has occurred around some springs in all deer ranges of Clark County. Another conflict arises when springs are developed. Riparian habitat which provides succulent summer forage is lost, and the water is piped out of deer habitat or into troughs located within corrals, making it inaccessible to mule deer. Such conflicts with water sources are identified in the 1979 Clark County Wildlife Special Habitat Inventory conducted by this office. A summarization of this inventory and what actions would be necessary to remedy conflicts is presented in Tables .46-13 and .46-14.

Harvest

Harvest data for the past five years for deer is presented in Table .46-15. The table presents the data by Nevada Department of Wildlife Management Units.

Nonconsumptive Use

There are no known nonconsumptive uses of mule deer occurring in the county.

Habitat Loss or Change

As indicated in Conflicts, habitat loss in the Spring Mountains is occurring as successional vegetation communities approach climax. In all ranges, riparian habitat that provides succulent summer forage has been lost through trampling by livestock and/or wild horses and by developing springs.

*** Opportunities

Population increases in mule deer in the Spring Mountains could probably be realized through vegetation manipulation in the form of wildfires, controlled burns, or mechanical treatment. All mule deer ranges could be improved by providing more yearlong waters and mitigating the conflicts around waters identified in the Clark County Wildlife Special Habitat Inventory as summarized in Tables .46-13 and .46-14.

c. ROCKY MOUNTAIN ELK (Cervus canadensis)

Population History

"Rocky Mountain elk (Cervus canadensis) are not native to southern Nevada but do occur in limited numbers on the Spring Mountain Range as a result of a transplant that occurred in 1935. Records show that the Las Vegas Chamber of Commerce in cooperation with local sportsmen released a total of 21 animals that were secured from Montana into the Kyle Canyon drainage of the Spring Mountains. The limited population that persists through the present day is a result of that transplant.

"Observations recorded since the late 1930s show that the elk have been distributed throughout much of the range located between Red Rock Summit on the south and Mount Stirling on the north, with concentrations noted for Kyle Canyon, Deer Creek, Wheeler Wash, Wallace Canyon, Trout Canyon, and the vicinity of Mount Stirling. The longest movement noted by any of the animals was documented in 1946 when two elk were observed in Three Lakes Valley near the south end of the Desert Mountain Range.

"Population estimates for all large mammal species in Nevada until recently, were based largely on conjecture and in most cases represented little more than 'educated guesses' by one or more individuals. Elk numbers on the Spring Range, for example, were based entirely on a few random observations collected throughout the year in addition to documentation of elk sign. Several summer waterhole counts were also conducted in select locations although the results generally met with poor success. Most of these estimates place the number of animals on the Spring Range at between 80 and 100 individuals from about 1940 through the 1960s. Liberal estimates went as high as 200 animals although no data were available to support the figures.

"The historic data show that the introduced elk commonly utilized those portions of the Spring Range that had been recently burned and therefore provided more forage in the form of grass species. The population probably approached 100 individuals or more shortly after the release because of the optimum conditions at that time.

"The Spring Mountain Range has been protected from wildfire for a considerable number of years and as a result much of the habitat is returning to climax vegetative communities which are not optimum for elk. Climax communities at the higher elevations in southern Nevada consist largely of monotypic stands of pinyon-juniper woodlands with little or no understory. It is suspected that elk numbers on the Spring Range have gradually declined during the past 20 years because of the habitat changes.

At the same time the more mesic sites were being utilized for urban and recreational development.

"Specific data for elk on the Spring Range continues to consist of only occasional random observations of animals and sign even though increased effort has been made to census the population. Aerial censusing, waterhole counts, and other methods needed to document the population parameters have generally met with poor results, largely because of low population numbers in relation to large amount of total habitat occupied. Although no data are available, it is suspected that the current population numbers less than 75 individuals" (NDW February 1980).

Seasonal Use Areas

Seasons: "There doesn't appear to be any particular seasonal use areas that are used consistently by the elk in the area nor does there appear to be a distinct winter or summer range. The animals are thinly distributed throughout the entire area yearlong with some shifts noted during years of heavy snowfall (elevational migration). Key habitat areas would be difficult to define for the limited population except for those areas surrounding summer waterholes" (NDW February 1980).

Location: Habitat of elk in Clark County is shown on the Mule Deer and Elk Distribution Overlay.

Food

"Studies indicate that elk as well as all other herbivores on the Spring Mountain Range will utilize a wide variety of plant species in order to survive rather than being selective as to preferred species. The desert environment does not allow much selectivity for foraging animals in comparison to better quality habitats because of a relative low density of plants and general lack of diversity. Based on the rumen analysis of six harvested bulls from the area, diets consisted of large quantities of Gambel's oak (Quercus gambelii), unidentified species of grass, silk-tassel (Garrya flavescens), and even desert yucca (Yucca sp.). The food habits undoubtedly change seasonally and perhaps annually depending on moisture conditions" (NDW February 1980).

Table .46-16 indicates the total perennial elk forage capacity by grazing allotment.

To meet the reasonable number of 200 elk, 160 AUMs are needed. Reasonable numbers are mutually developed by NDW and BLM under a statewide cooperative effort. They represent a committed management level for elk habitat and population.

Water

The Mule Deer and Elk Distribution Overlay indicates the areas serviced by yearlong water in elk habitat. Many areas exist where seasonal waters could be developed or where guzzlers could be installed to provide yearlong water.

Cover

Cover requirements for elk in the Spring Mountains are not presently known. It is suspected that cover, in the form of pinyon-juniper and ponderosa pine is more than sufficient in most areas of the Spring Mountains. An overabundance of this type of cover may be reducing the forage availability and carrying capacity for elk.

Important Use Areas

Observations of elk in the Spring Mountains indicate that burned areas, particularly burned areas near water may be important (Roy Leach, NDW personal communication, 1981). The Mule Deer and Elk Distribution Overlay indicates important use areas for elk. Criteria used to determine important areas include elk observations from Nevada Department of Wildlife records, closeness of water, and presence of burns or natural meadows.

Special Use Areas

No special use areas have been designated for elk in Clark County.

Conflicts

"One of the most important factors currently affecting the distribution and numbers of Rocky Mountain elk on the Spring Mountain Range is the complete protection of the area from wildfires which ultimately results in large stands of climax plant communities. The range is marginal habitat even given the best of conditions and the maintenance of monotypic stands of trees lowers the carrying capacity even further.

"Another important factor affecting the few elk in the area is the ever-increasing use of the area by the general public for woodcutting, off-road travel, and general recreation. Studies have shown that high level elk populations and intensive public use are not compatible. The old Wheeler burn area, for example, is bisected by a heavily traveled road that receives increased public use each year. Public use not only displaces elk use through competition for space but also results in increased poaching which is particularly detrimental to low level

populations." (NDW February 1980) Approximately 135 miles of roads (paved and dirt) bisect the elk habitat in the Spring Mountains.

It is felt wild horses and burros may be competing with elk in many parts of their range in the Spring Mountains (Roy Leach NDW personal communication 1981).

Harvest

"The primary purpose of the elk introduction on the Spring Range was to establish a resident population that could offer recreational hunting for the future. An open season by permit only was established during 1958 and ran intermittently through 1974. There were a total of 59 bull elk harvested from the population during the 16 year period.

"The season was closed for elk on the Spring Mountain Range after 1974 and has not been open since that time. The primary purpose of the closure was the poor hunter success reported during the previous two seasons in addition to a general lack of information relative to the population status. Recommendations during the past several years have been to maintain a closure in the area until such time that sufficient data is available to warrant a hunt that will not be detrimental to the population." (NDW February 1980)

*** Opportunities

Habitat for elk could be improved in several ways. Increasing trends in vegetation communities approaching climax and reducing forage needs to be reversed. This can be accomplished through a firewood management program by selecting potential areas and allowing the public or commercial operators to cut green pinyon or juniper. After the sales are complete, access to the area should be limited in order to reduce conflicts that would occur from human disturbance. Prescribed or natural fires can also be used to reduce pinyon/juniper and encourage establishment of grasses and other forage species for elk.

More detailed information regarding elk use in parts of the Spring Mountains is needed to determine where human use conflicts may be occurring and what means can be taken to alleviate such conflicts.

The potential exists for perhaps expanding elk use within their present distribution by developing existing ephemeral springs to provide yearlong water or by constructing guzzlers.

Several grazing allotments in the Spring Mountains are either unallotted or no livestock grazing is allowed. These allotments within the elk habitat should continue to be managed with no livestock grazing both because elk avoid areas where cattle are present, and elk and livestock diets are similar (Mackie 1970; Bailey 1979; Hansen and Clark 1977; Murie 1979).

The competition between elk and wild horses/burros should be further investigated and conflicts between them should be resolved.

A habitat management plan should be developed for the Spring Mountain elk herd. Consideration of the previously outlined opportunities and conflicts should be given.

d. PRONGHORN ANTELOPE (Antilocapra americana)

Population History

"Although pronghorn antelope are native to the State of Nevada, they are not native to the valley areas of Clark County. The first record of antelope in the county was during September of 1945 when 6 antelope fawns (5 female and 1 male) were transported from Hart Mountain Refuge in southern Oregon to the Corn Creek Field Station in southern Nevada. They were hand raised for about six months and then allowed to roam free in the Las Vegas Valley. Much of the reported use, however, was in the vicinity of the Field Station since the herd was semi-tame and often fed oats even after their release. Limited production was documented during the next several years although survival was almost nonexistent. The small herd persisted until late 1952 after which time the remaining two animals left in the herd disappeared.

"The only other attempt to introduce antelope into Clark County occurred on March 14, 1950, when 7 bucks and 13 does trapped near Billings, Montana were released near Cold Creek on the Spring Mountain Range. Although much of the documented use during the next several years remained in the vicinity of the release site, some individuals were observed as far away as the Manse Ranch in Pahrump Valley. The most unusual sighting was of a solitary buck that was observed in the heavy timber at about 7,500 feet near the head of Deer Creek. By the mid-1950s the herd was reportedly scattered in small bands between Kyle Canyon on the south and the Nye County line on the north with concentrations noted near Cold Creek.

"Production and survival of fawns in the herd were documented by Desert Game Range personnel for several years after the release.

In 1952, for example, a total of 10 does were observed with 13 fawns. Survival was high enough that by 1955 a total of 38 antelope were observed near the Cold Creek Headquarters. The highest recorded estimate for the introduced population was 40 animals.

"The status of the introduced population is unknown at the present time although it is suspected that only a handful (if any) remain in the area. The last documented observation in the area was during 1973 with several other unconfirmed reports through 1975. The Las Vegas Valley does not provide suitable habitat for antelope and it is doubtful that a resident population could survive over a several year period of drought. It is suspected that the population expanded immediately after the release because of favorable range conditions and because the herd was protected by the resident manager who lived at Cold Creek. During the last twenty years, however, the population has gradually declined and will probably be completely extirpated during the next several years if there are any left at present." (NDW February 1980).

e. COLLARED PECCARY (Pecari angulatus)

Population History

"Peccaries or javelina are not native to Nevada but were introduced into the state from Texas and Arizona during the 1950s. A total of 121 javelina were wild trapped and released near Pine and McCullough Springs on the McCullough Mountain Range in an attempt to establish a huntable population.

"Follow-up efforts after the release were extremely sporadic and as a result few documented observations are available to show the initial success or failure of the transplant. Occasional observations continue to be reported to the Nevada Department of Wildlife Office by sportsmen although most are unconfirmed as to their authenticity. The last documented observation by an NDW biologist was during October of 1975 when a total of three javelina were sighted on the crest of the range above Railroad Spring. The last unconfirmed observation was during November of 1979 when a sheep hunter reported observing eight individual javelina near McCullough Spring.

"The limited data suggest that reproduction is occurring in the transplanted population and that a small herd exists through the present time. It is suspected, however, that the habitat is marginal for the species because of the lack of required forage plants (such as Opuntia sp.) and that the range will support only a few animals even under optimum conditions. This small herd may persist for several more years into the future if conditions remain favorable" (NDW February 1980).

f. MOUNTAIN LION (Felis concolor)

Population History

Mountain lions are historic residents of the county. The mountain lion received official status from the State of Nevada as a game animal in 1968.

"Mountain lions are known to occur as a resident game species in only the Virgin Range, Spring Mountain Range, and perhaps the McCullough Mountain Range. These areas are considered as Class II habitat types (fair to good) since they contain only low numbers of prey species in comparison to higher quality habitats. Both areas have suitable topographic - vegetative features needed by lions for survival although neither is particularly extensive when compared to the ranges of central and northern Nevada. Sightings of lions and/or lion sign have been relatively common in the Virgin Range and Spring Mountain Range for a considerable number of years" (NDW February 1980).

"Several observations of lions and/or lion sign have been documented within Clark County in populated valley areas at a considerable distance from the Spring Mountain Range. These sightings, however, are thought to represent young animals that are exhibiting exploratory behavior or older animals that are no longer able to compete for a living. Table .46-17 lists miscellaneous records of lion occurrence in Clark County in areas other than the Spring Mountain Range. It is doubtful that any of the random observations listed in this table are representative of resident animals, with the possible exception of the McCullough Range sightings" (NDW February 1980).

According to a 1979 mountain lion status and trend report an estimated population of five lions was made for the Spring Range with an estimate of ten lions in the remainder of the Clark County. This estimate is based on random observation, not inventory data (NDW February 1980).

Seasonal Use Areas

No specific seasonal use areas have been identified for mountain lions.

Important Use Areas

No specific important use areas or crucial areas have been identified.

Special Use Areas

No special use areas have been identified.

Conflicts

No specific conflicts have been identified. Extensive removal of tree cover, increased access, and human activity could negatively impact mountain lion.

Harvest

Harvest of mountain lions in the county has been minor and on an irregular basis. Sufficient data is not available for development of a table.

Nonconsumptive Use

Research in the county is needed to determine annual densities, and population status and trend.

Habitat Loss or Change

No specific habitat loss or change has been documented.

- g. RABBITS AND HARES: Black-tailed Jackrabbit (Lepus californicus), Mountain Cottontail (Sylvilagus nuttalli), Desert Cottontail (Sylvilagus auduboni).

Population History

There are two game species, mountain and desert cottontail, and one nongame species, black-tailed jackrabbit, present in Clark County.

No definitive data is available with respect to population history in the county. It is assumed that the rabbit and hare populations have cyclic increases and decreases in number of animals per square mile (density).

Population trend is presently believed to be stable at high population levels (personal communications Nevada Department of Wildlife). Because of the cyclic nature of rabbits and hares this situation could change relatively rapidly, depending on many factors including disease, climatic factors, or predation.

Seasonal Use Areas

Seasons: Occupation of habitat by rabbit and hares is yearlong.

Location: Preferred habitat of cottontail is considered to be in or about drainages where forage plants have higher water content and escape cover is sufficient to meet their needs. Jackrabbits are found throughout Clark County and are typically associated with more xeric (dry) sites than are cottontails.

Food

Food preferences of rabbits and hares can be summarized as succulent herbaceous materials, fruits, seeds, bark, and buds and foilage of woody species.

Water

Although rabbits and hares will utilize free water, it is not necessary. Their water requirements can be satisfied by water available in succulent plant materials.

Cover

Cover requirements of rabbits and hares are met by existing vegetation throughout Clark County.

Important Use Areas

No important use areas have been identified in relation to rabbit and hare use.

Special Use Area

No special use areas have been designated for rabbits or hares.

Conflicts

Competition for available forage between cottontail and ungulates may be occurring in drainages where overutilization of riparian zones is evident.

Harvest

Harvest data is not available by planning units. However, the total harvest for the entire Clark County area is available and is presented in Table .46-18.

Nonconsumptive Use

No known nonconsumptive use is occurring in regard to rabbits or hares in Clark County.

Habitat Loss or Change

The amount of habitat loss or change occurring in Clark County in relation to rabbit or hare use is unknown.

*** Opportunities

Protection of riparian habitats and water sources could improve habitat for rabbits (NDW February 1980).

h. FURBEARERS

Population History

"Furbearing mammals within the county are limited to the desert varieties because of the lack of large tracts of riparian habitat in most areas. Beaver (Castor canadensis) were introduced into the Willow Creek area of the Spring Mountain Range during the late 1940s but were subsequently removed about three years later.

There are currently no beaver found within the county.

"The coyote (Canis latrans) is perhaps the most commonly observed furbearing animal in the county, although it is not classified as a furbearer by NDW regulation. It is locally abundant throughout all elevations and all habitat types in Clark County, with densities dependent on annual changes in prey species densities. Although data relative to specific numbers of coyotes are not available for

the county, they would have to be classed as common. One animal for every four to five square miles of occupied habitat may be characteristic within the county.

"Bobcats (Lynx rufus) are also common throughout the county at all elevations although specific estimates of numbers are not available. Recent data collected from trappers in the southern part of the state indicate that this species may be much more common than originally thought although available information is necessarily tentative at this time.

"The kit fox (Vulpes macrotis) is a relatively common inhabitant to the valley areas of Clark County. Although specific estimates of population numbers are not available, the species is common throughout the county.

"The grey fox (Urocyon cinereoargenteus) is another important furbearing species which is common throughout the mountain ranges within both planning units. Although definite information is not currently available, grey fox densities are thought to approximate one to two foxes per square mile of occupied habitat (NDW February 1980).

Other minor species harvested in Clark County for fur are the badger (Taxidea taxus), ring-tailed cat (Bassariscus astutus), spotted skunk (Spilogale putorius), and striped skunk (Mephitis mephitis).

The preceding species are not classified as furbearers by the Nevada Department of Wildlife.

Seasonal Use Areas

No specific seasonal use areas have been identified for furbearers.

Important Use Areas

No specific important use areas or crucial areas have been identified.

Special Use Areas

No special use areas have been identified.

Conflicts

No specific conflicts have been identified.

Harvest

Table .46-19 shows the fur harvest within Clark County for the past five years.

Table .46-20 shows the fur harvest values for Nevada for the 1979-80 season. The results shown in the table are from past-season questionnaires.

Nonconsumptive Use

No nonconsumptive uses have been identified in the county.

Habitat Loss or Change

No specific habitat losses or changes have been identified in the county.

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TABLE .46-1
Clark County

BIGHORN SHEEP POPULATION ESTIMATES AND PROJECTED REASONABLE NUMBERS
IN CURRENT HABITAT

Mountain Range	Overlay Symbol	Sq. Mi Occupied Habitat	Current Estimated Numbers	Percent of Present Numbers	Projected Reasonable Numbers	Percent of Total Projected Numbers	Projected ALM Demand	
							Yearlong	Summer
Highland	BY-1	33.3	61	5	167	3	401	134
McCullough	BY-2	170.0	160	12	850	17	2,040	680
Eldorado ¹	BY-3	102.9	120	9	515	10	1,236	412
Newberry	BY-4	41.7	86	6	209	4	502	167
NY/Castle/Piute	BY-5	31.6	25	2	158	3	379	126
Bird Spring	BY-6	29.9	—	—	150	3	360	120
South Spring	BY-7	90.7	50	4	454	9	1,090	363
Red Rock/LaMadre	BY-8	102.0	158	12	510	10	1,224	408
River ¹	BY-9	16.1	74	6	81	2	194	65
Stateline Subtotal		618.2	734	56	3,094	61	7,426	2,475
Black	BY-10	81.7	306	23	409	8	982	327
Muddy	BY-11	125.1	102	8	626	12	1,502	501
Arrow Canyon	BY-12	82.1	104	8	411	8	986	329
Virgin ³	BY-13	36.6	32	2	183	4	439	146
Gold Butte ³	BY-14	25.3	10	1	127	3	305	102
Mormon ²	BY-15	6.4	14	1	32	1	77	26
Meadow Valley ²	BY-16	25.5	14	1	128	3	307	102
Virgin Valley Subtotal		382.7	582	44	1,916	39	4,598	1,533
County Total ⁴		1,000.9	1,316	100	5,010	100	12,024	4,008

¹ Estimated numbers and reasonable numbers provided by NDW adjusted to apply only to the portion of current habitat in which forage will be allocated, i. e. below T.24S.

² Numbers provided by BLM; Assumed equal distribution of sheep in the range and used latest NDW population estimate for range to determine population in Clark County portion; Assumed 5 sheep/sq. mi is reasonable number.

³ Numbers provided by BLM since these ranges are not surveyed by NDW or are unoccupied; assumed 5 sheep/sq. mi. is reasonable number if yearlong water was available.

⁴ In areas with forage allocation only; excludes portions of River and Eldorado Ranges.

TABLE .46-2
Clark County
HABITAT QUALITY AND RESOURCE USE CONFLICT RATINGS

Range	Habitat ¹		Competitive		Horse/ Burro		Mining/ Indust.		Comm. Site		Overall	
	Rating	Livestock	ORV		Recreation				Powerline		Conflict	
<u>Current</u>												
Highland	E	H	M									H
McCullough	E	H	H		M		L	M	M			H
Eldorado	E	L	H		M	M	M	L	L			M
Newberry	E	L	L						L			L
NY/Castle	G	H	M				L		L			M
Bird Sp.	G		M		H							H
So. Sp.	E	L	M		M	L	M	L	L			L
Red Rock	E				H	H	L	L				H
River	E		L			L			L			L
Black	E	L			M							L
Muddy	E	L	L		H	H	L					H
Arrow Canyon	E	L	L		L		L	L				L
Meadow Valley	E	L	M									L
Mormon	E	L	L									L
Virgin	G	H										M
Gold Butte	E	M			L							L
<u>Historic</u>												
McCullough	F	L	L						L			L
Eldorado	F		M						L			L
Newberry	E	M	L									L
NY/Castle	F	L	M									L
Bird Spring	F		L		L	L			L			L
So. Sp.	E	L	L		L							L
No. Sp.	F	M	L		M	L	L	L				L
Muddy	F	L	L			M						L
Arrow Canyon	G	L	L									L
Virgin	G	M				L						L
Gold Butte	E	M			H							H
Dry Lake	F	L	M				L	M	M			L
Sunrise	G		L			H	L		L			M

¹ Escape terrain: E = excellent G = good F = fair

² Conflict: H = high M = moderate L = low blank = nonexistent or unknown

TABLE 46-3
Stateline Planning Unit
REASONABLE NUMBERS, ACRES, AND AVAILABLE ALM*5 SUMMARY FOR BIGHORN SHEEP

Mtn. Range	Designa- tion	Projected*1		Allot.	Current Habitat				Potential Habitat				All Habitat					
		Reasonable Numbers			Yearlong(BY)		Summer (BS)		Yearlong(BPY)		Summer(BPS-H)*2		Summer(BPS-C)*3		Yearlong		Summer	
		No.	ALMs		Acres	ALMs	Acres	ALMs	Acres	ALMs	Acres	ALMs	Acres	ALMs	Acres	ALMs	Acres	ALMs
Highland	BY-1	167	401	McCullough	21,326	387	4,579	58					15,149	216	21,326	387	19,728	274
McCullough	BY-2																	
	BPY-2	850	2,040	Hidden V.	30,281	731			5,596	104	1,393	26	14,348	323	35,877	835	15,741	349
				McCullough	52,767	2,230	8,660	398			19,410	1,113	52,767	2,230	28,070	1,511		
				Jean Lake	25,728	699	9,036	201	24,284	1,171	3,462	171	13,595	497	49,663	1,852	26,094	869
	Total			108,776	3,660	17,697	599	29,880	1,275	4,855	197	47,353	1,933	138,307	4,917	69,905	2,729	
Eldorado	BY-3	*4	*4															
	BPY-3	515	1,236	Ireteba	65,879	1,401	12,708	288	10,946	127	652	9	35,915	762	76,825	1,528	49,275	1,059
Newberry	BY-4																	
	BPY-4	209	502	Christmas Tree	5,702	76	717	7	11,549	117	4,656	47	3,235	46	17,251	193	8,608	100
				Newberry	20,986	356	9,451	155	21,761	1,117	19,048	873	8,221	147	42,747	1,473	36,720	1,175
				South Point					694	8	447	5			694	8	447	5
				Ireteba					1,788	30					1,788	30		
	Total			26,688	432	10,168	162	35,792	1,272	24,151	925	11,456	193	62,480	1,704	45,775	1,280	
NY/Castle/ Piute	BY-5																	
	BPY-5	158	379	Crescent Peak	20,239	241	12,290	202	2,732	39	2,501	36	464	10	22,971	280	15,255	248
Bird Sp.	BY-6	150	360	Spring Mtn.	14,894	232	4,214	74	20,499	279	632	11	4,375	62	35,393	511	9,221	147
	BPY-6			Table Mtn.	4,216	121	132	5							4,216	121	132	5
				Total	19,110	353	4,346	79	20,499	279	632	11	4,375	62	39,609	632	9,353	152
South Sp.	BY-7																	
	BPY-7	454	1,090	Spring Mtn.	22,792	217	3,218	33	16,601	238	5,110	62	18,042	172	39,678	448	26,370	267
				Black Butte	3,866	11			710	7			4,576	18				
				Roach Lake	2,788	120							2,788	120				
				Table Mtn.	25,200	331	3,190	38	3,015	12	15	0	4,015	43	28,215	343	7,220	81
				Unalotted	3,382	82							3,382	82				
				(2222)														
	Total			58,028	761	6,408	71	20,326	257	5,125	62	22,057	215	78,639	1,011	33,590	348	

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APR 13 1981

*2 BPS-H: potential bighorn summer habitat in unoccupied, historic bighorn habitat

*4 Reasonable numbers modified to apply only to the portion of current habitat in which forage is allocated; forage is not allocated above T24S in

Ireteba Peaks allotment and on NPS lands in the River Range

*5 All AUMs are determined from yearlong ac/AUM figures, assuming equal distribution yearlong

TABLE .46-4
Virgin Valley Planning Unit
REASONABLE NUMBERS, ACRES, AND AVAILABLE AUM*5 SUMMARY FOR BIGHORN SHEEP

Mtn. Range	Designa- tion	Projected*1		Allot.	Current Habitat				Potential Habitat				All Habitat					
		Reasonable	Numbers		Yearlong(BY)	Summer (BS)	Yearlong(BPY)	Summer(BPS-H)*2	Summer(BPS-C)*3	Yearlong	Summer							
		No.	AUMs		Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs		
Black	BY-10	409	982	Muddy Mtn	19,727	169	12,615	112				4,121	32	19,727	169	16,736	144	
				White Basin	32,578	530	14,060	191				4,559	62	32,578	530	18,619	253	
				Total	52,305	699	26,675	303				8,680	94	52,305	699	35,355	397	
Muddy	BY-11 BPY-11	626	1,502	Muddy Mtn	48,775	403			14,336	141				63,111	544			
				White Basin	31,269	472	2,926	33	4,303	28		21	3	35,572	500	2,947	36	
				Muddy R.					6,027	170				6,027	170			
				Glendale					2,501	74				2,501	74			
				Upper Muddy Mtns.					2,233	45				2,233	45			
				Total	80,044	875	2,926	33	29,400	458		21	3	109,444	1,333	2,947	36	
Arrow Canyon BW-12	BPW-12	411	986	Dry Lake	7,778	45			1,502	9				9,280	54			
				Pittman														
				Well	11,245	220			527	13				11,772	233			
				Ute	9,749	57								9,749	57			
				Arrow														
				Canyon	23,784	185								23,784	185			
				Total	52,556	507			2,029	22				54,585	529			
Virgin	BY-13 BPY-13	183	439	Billy Goat	12,331	201	5,738	61	12,789	134	4,811	26	6,216	132	25,120	335	16,765	219
				Bunkerville	7,360	31	7,360	31	19,337	563	10,556	315			26,875	594	17,916	346
				Hen Spring	1,403	4	1,344	4	3,806	311	3,806	311			5,103	314	5,103	315
				Mesquite														
				Comm.					9,757	739	9,757	739			9,757	739	9,757	739
				Lime Spr.	1,512	54	1,379	49	872	37	872	37	133	6	2,384	68	2,384	92
				Total	22,606	290	15,821	145	46,561	1,784	29,802	1,428	6,349	138	69,239	2,050	51,925	1,711

UPPER MORMON
MESQUITE (1/4/82)

TABLE 46 (continued)
Virgin Valley Planning Unit
REASONABLE NUMBERS, ACRES, AND AVAILABLE AUM*5 SUMMARY FOR BIGHORN SHEEP

Mtn. Range	Designa- tion	Projected*1			Current Habitat						Potential Habitat				All Habitat			
		Reasonable		Allot.	Yearlong(BY)		Summer (BS)		Yearlong(BPY)		Summer(BPS-H)*2		Summer(BPS-C)*3		Yearlong		Summer	
		No.	AUMs		Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs		
Gold Butte	BY-14																	
	BPY-14	127	305	Gold Butte	16,183	124	3,350	15	74,427	1,336	54,472	1,184	4,802	42	90,610	1,460	62,624	1,241
				Azure Ridge					3,410	10	2,559	7			3,410	10	2,559	7
				9999					37,919	745	23,025	428			37,919	745	23,025	428
				Total	16,183	124	3,350	15	115,756	2,091	80,056	1,619	4,802	42	131,939	2,215	88,208	1,676
Mormon*4	BY-15	32	77	Upper Mormon Mesa	4,065	101									4,065	101		
Meadow Valley*4	BY-16	128	307	Arrow Canyon	2,501	27									2,501	27		
				Acton														
				Farrier	13,158	278									13,158	278		
				Total	15,659	305									15,659	305		
Sunrise*4	BPW-17	120	288	Sunrise					15,513	686					15,513	686		
Dry Lake*4	BPW-18	40	96	Muddy Mtn					13,350	240					13,350	240		
				Dry Lake					12,462	372					12,462	372		
				Total					25,812	612					25,812	612		
TOTAL		2,076	4,982		243,418	2,901	48,772	496	235,071	5,653	109,858	3,047	19,852	277	478,561	8,530	178,435	3,820

*1 Provided by Nevada Department of Wildlife; apply to current, yearlong habitat only

*2 BPS-H: potential bighorn summer habitat in unoccupied, historic bighorn habitat

*3 BPS-C: potential bighorn summer habitat in current, yearlong, bighorn habitat

*4 Reasonable numbers provided by BLM, since NDW provided input for Meadow Valley and Mormon Ranges for Caliente URA, and since NDW did not present reasonable numbers for unoccupied habitat (Sunrise and Dry Lake); assumed five sheep per square mile of available habitat would meet reasonable numbers as did NDW

*5 All AUMs are determined from yearlong ac/AUM figures assuming equal distribution yearlong

TABLE .46-5
Clark County
BIGHORN PERENNIAL AUM DEMAND AND AVAILABILITY IN CURRENT HABITAT

Range	Yearlong Demand (AUMs)		Summer Demand (AUMs)		Available AUMS		
	Present	Reasonable Numbers	Present	Reasonable Numbers	Yearlong	Summer*	Summer**
<u>Stateline</u>							
Highland	146	401	49	134	387	58	38
McCullough	384	2,040	128	680	3,660	599	492
Eldorado	288	1,236	96	412	1,401	288	193
Newberry	206	502	69	167	432	162	69
NY-Castle- Piute	60	379	20	126	241	202	123
Bird Spring	0	360	0	120	353	124	49
South Spring	120	1,090	40	363	761	71	49
Red Rock/ LaMadre	380	1,224	127	408	961	685	377
River***	118***	194	0	0	112	0	0
<u>Virgin Valley</u>							
Black	734	982	244	654	699	191	
Muddy	245	1,502	82	1,002	875	33	24
Arrow Canyon	166***	986	0	0	507	0	0
Virgin Peak	76	439	25	293	290	145	100
Gold Butte	24	305	8	203	124	15	9
Mormon	22***	77	0	0	101	0	0
Meadow Valley	22***	307	0	0	305	0	0

* Using yearlong acres/AUM

** Using summer acres/AUM

*** Present demand is for 8 months since these ranges have no summer habitat in Clark County

TABLE .46-6
Clark County

BIGHORN WINTER CONCENTRATION AREAS

Mountain Range	Designation	Acres
Highland	BWC-1	12,006
McCullough	BWC-2	25,549
Eldorado	BWC-3	39,757
Newberry	BWC-4	7,066
Red Rock/LaMadre/N. Spring	BWC-8	9,856
River	BWC-9	4,250
Black	BWC-10	22,221
Muddy	BWC-11	17,050
Arrow Canyon	BWC-12	27,852

TABLE .46-7
Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source	Water(1)	Location				Bighorn(2)	Obvious
		Name	Classif.	T	R	S	1/4/1/4	Use	Conflict
Highlands	5413	Bell Well	unk	28	63	8	nw/nw	PC	
		Guzzler	unk	27	62	3	s 1/2	PC	
		Highland Pockets	S	26	62	22	sw	PC	
		Thomas Sp.	YL	27	62	23	ne/nw	PC	
		Thomas Seep	S	27	62	23	se/nw	PC	
		Deadhorse Sp.	S	27	62	21	se/se	PC	
		Cow Sp.	YL	27	62	26	sw/ne	PC	Livestock
		Highland Sp.	YL	27	62	16	nw/sw	C	Livestock
		Ora Hanna Sp.	YL	27	62	5	ne/se	PC	
		Guzzler	S	26	62	34	nw	PC	
		Rock Sp.	YL	26	62	34	nw/ne	PC	
		Ink Well	unk	27	62	11	nw/nw	PC	
N.Y.-Castle	5418	Crescent Sp.	YL	28	61	29	ne/sw	PC	Livestock
		Clarks Well	YL	28	61	36	ne/sw	C	Livestock
		Hopps Well	YL	28	61	25	nw/se	C	Livestock
		Burro Sp.	unk	28	61	26	sw/ne	PC	
		Jack's Well	YL	30	62	4	se	C	
		Stray Cow Well	YL	30	62	15	sw	C	
McCullough	5416	Calada Well	YL	27	60	22	nw/nw	PC	Livestock
		McClanahan Well	S	26	61	17	nw/ne	PC	Livestock
		Site #1							
		McClanahan Well	S	26	61	8	nw/sw	PC	Livestock
		Site #2							
		Seep	S	28	61	18	se/nw	PC	Mining
		Scotts Well	S	28	61	7	nw/ne	PC	Livestock
		Lucy Grey	S	27	61	30	se/nw	PC	Livestock
		Railroad Sp.	YL	26	61	31	se/ne	C	
		Badger Seep #2	YL	26	61	31	se/se	PC	Livestock
		Granite Sp.	S	27	61	20	sw/nw	PC	Livestock
	5412	Tubbs Seeps	S	27	61	18	sw/se	PC	Livestock
		Willow Sp.	YL	27	61	18	ne/nw	C	Livestock
		Bar Bridge Sp.	unk	28	61	8	sw/sw	PC	
		Lucy Grey 1,2,3	unk	27	60	36	ne	PC	
		Lucy Grey 4	unk	27	61	30	sw/se	PC	
		Little Pine	unk	27	61	29	nw/ne	PC	
		Seeps	unk	27	61	6	nw/nw	PC	
		Catclaw Sp.	unk	26	61	17	se/sw	PC	
		Joshua Sp.	unk	27	61	17	nw	PC	
		Unnamed Seep	S	23	61	33	se/se	PC	
		Unnamed Seep	S	24	61	2	nw/ne	PC	
		Unnamed Seep	S	24	61	24	se/se	PC	
		Water Catchment 2	YL	24	61	2	SE/sw	PC	

TABLE .46-7 (continued)
Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1) Classif.	T	R	S	Location 1/4/1/4	Bighorn(2) Use	Obvious Conflict	
Eldorados	5413	Bullion Sp.	YL	28	61	20	ne/se	PC		
		Mesquite Sp.	S	26	61	22	se/ne	PC	Livestock	
		McCullough Sp.	YL	26	61	26	se/sw	C	Livestock	
		Donte Sp.	S	27	61	28	se/nw	PC		
		Unnamed Sp.	S	27	61	4	se/se	PC	Livestock	
		Seep	S	23	62	27	sw/ne	PC		
		Seep	S	23	62	27	nw/ne	PC		
		Dripping Cave	S	23	62	27	ne/se	PC		
		Lone Pine Sp.	S	26	61	22	se/nw	PC	Livestock, horses	
		Southern Pine Sp.	unk	27	61	28	nw/ne	PC		
		Seep	unk	27	61	28	sw/nw	PC		
		Pine Seep	unk	27	61	28	se/se	PC		
		Goat Camp Sp.	unk	27	61	21	nw/ne	PC		
		Blackstone Sp.	unk	27	61	15	nw/ne	PC		
	Willow Sp.	YL	26	61	34	ne/nw	PC			
	Unnamed Sp.	unk	26	61	28	se/se	PC			
	Granite Sp.	unk	28	61	6	nw/nw	PC			
	5411	Jonas Sp. 67	YL	27	64	14	nw/se	PC		
		Unnamed Sp. 68	YL	27	64	12	nw/ne	PC		
		Unnamed Sp. 69	YL	27	64	12	ne	PC		
		Aztec Wash S.	S	26	65	30	nw	PC		
		76	YL	26	64	4	sw	PC	Mining	
		Tule Seep 77	S	26	64	28	se	PC		
		Unnamed Sp. 79	S	25	64	34	ne/sw	PC		
		Unnamed Sp. 80	S	26	64	8	sw/ne	PC	Vehicle Traffic	
		Tule Sp.	YL	26	64	33	nw/ne	C		
		Bridge Sp.	S	25	64	34	nw/se	PC		
		Forlorn Hope	S	26	64	1	ne/sw	PC		
		Keyhole Canyon		26	63	3	se	PC		
		Seep		27	64	12	sw	PC		
		Spring		26	64	22	nw/nw	PC		
		Horse Sp.	S	26	64	11	nw/nw	PC	Residence, Mining	
Newberry		5414	Roman Sp.	S	31	65	4	ne/ne	PC	Livestock, Residence
			Yellow Stone Sp.	S	31	65	4	se/se	PC	
			Unnamed Seep	S	31	65	17	se/nw	PC	
	Lower Cottonwood		S	31	65	17	nw/nw	PC		
	5415	Upper Cottonwood	S	31	65	17	nw/nw	PC		
		Rattlesnake Sp.	S	31	65	16	ne/ne	PC		
		Loughlin 300 Gzyzler	YL	32	65	22	nw/ne			

TABLE .46-7 (continued)

Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1)		Location				Bighorn(2) Use	Obvious Conflict
			Classif.	T	R	S	1/4	1/4		
South Sp. Mtn.	5426 4444	Quail Sp.	S	32	65	15	ne	ne	PC	Livestock
		Hiko Sp.	S	32	65	12	se	se	PC	
		Xmas Tree Mine	S	31	65	9	nw	sw	PC	
		Cottonwood Sp.	YL	31	65	28	nw	se	PC	
		Rat Nest Seep	S	31	65	16	nw	sw	PC	
		Dripping Cave Sp.	S	31	65	36	sw		PC	
		Pipe Sp.	S	31	65	36	ne	nw	PC	
		Corral Sp.	S	31	66	18	sw	sw	PC	Livestock, recreation
		Discovery Sp.	S	31	65	12	ne	sw	PC	
		Willow Sp.	YL	31	65	14	nw	nw	PC	
		Grapevine Sp.	YL	31	65	15	nw	nw	PC	
		Bridge Canyon	S	32	65	1	se		PC	
		Pipe Sp.	YL	31	65	1	ne	ne	PC	
		Unnamed	YL	31	65	24	nw		PC	
		Unnamed	S	32	65	1	se		PC	
		Argentine Mine	unk	25	58	33	se	se	PC	Horses/burro Horses/burro Mining Horses/burro
		Bird Sp.	YL	24	59	4	sw	ne	PC	
		Wilson Tank	S	23	58	24	ne	sw	PC	
		Aztec Tank	S	23	58	21	se	se	PC	
		Ninety Nine Sp.	YL	23	58	8	se	ne	PC	
		Mexican Sp.	S	23	58	30	nw	sw	PC	
		Potosi Sp.	YL	23	57	12	ne	nw	PC	Recreation Livestock
		Cave Sp.	YL	24	58	6	nw	se	C	
		Unnamed Sp.	YL	24	58	6	nw	se	C	
North Spring	4444	Shovel Sp.	unk	22	58	22	ne	se	PC	Recreation
		Point Sp.	unk	22	58	10	nw	nw	PC	
		Sandstone Sp.	YL	22	58	3	nw	sw	PC	
		Calico Sp.	YL	21	59	6	nw	sw	PC	
		Little Sp.	YL	21	58	1	se	ne	PC	
		Ash Creek Sp.	YL	21	58	1	nw	ne	PC	
		Cabin Sp. #1	S	20	58	6	se	nw	PC	Recreation Recreation Recreation
		Cabin Sp. #2	S	20	58	6	se	nw	PC	
		Harris Stream	S	20	57	15-1	-		PC	
		DJ Sp.	S	20	58	18	nw	sw	PC	
		Seep	S	20	57	14	ne	ne	PC	
		Seep	YL	20	57	14	ne	se	PC	
	5431	Wallace Sp.	YL	18	55	29	ne	nw	PC	Livestock Livestock, Recreation
		Kiln Water Catch.	YL	18	54	12	se	ne	PC	

TABLE .46-7 (continued)
Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1) Classif.	T	R	S	Location 1/4/1/4	Bighorn(2) Use	Obvious Conflict
Red Rocks	5442	Willow Creek	YL	18	55	2	sw/ne	PC	Recreation, Livestock
		Buck Sp.	YL	18	55	35	nw/sw	PC	Livestock, Horses
		Cold Creek	YL	18	55	1	ne/se	PC	Recreation, Livestock
		Wheeler Sp.	YL	18	55	20	nw/ne	PC	Livestock, Recreation
		Kuip Sp.	YL	20	56	31	ne/se	PC	
		Trout Sp.	YL	20	56	10	ne/sw	PC	
		Seep	S	20	56	16	nw/se	PC	
		Peak Sp.	YL	20	56	6	ne/sw	PC	Livestock, Horses
		Wheeler Seep	S	19	54	12	nw/ne	PC	
		Seep	YL	20	56	30	nw/se	PC	Horses, Livestock
		Bob Owens	unk	18	55	16	ne/nw	PC	
		Cougar Sp.	unk	18	55	3	sw/sw	PC	
		Lower Deer Sp.	unk	18	55	3	nw/nw	PC	
		Horse Sp.	S	19	54	14	nw	PC	
		Grapevine Sp.	YL	19	59	16	sw/nw	PC	Burro, Livestock
	5431	Grassy Sp.	S	18	58	32	nw/se	PC	Burro, Livestock
		Sidehill Sp.	S	19	57	21	ne/ne	PC	
		Goodwater Sp.	unk	19	58	7	ne/ne	PC	
		Two Sp. #1	YL	18	57	28	sw/se	PC	
		Lee Sp.	unk	20	56	8	sw/ne	PC	
		Upper Deer Sp.	unk	18	55	3	ne/sw	PC	
	4444	Mud Sp. #1	YL	22	58	14	ne/sw	PC	Horses
		Mud Sp. #2	S	22	58	15	se/ne	C	Horses
		Lone Grapevine	YL	22	58	23	se/nw	C	Horses
		Moonshine Sp.	YL	22	58	22	sw/ne	C	Horse/Burro
		First Creek Sp.	YL	21	58	33	sw/ne	PC	Recreation
		Oak Creek Sp.	YL	21	58	21	se/se	PC	Recreation
		Pine Creek	YL	21	58	16	center	PC	Recreation
		Upper Pine Creek	YL	21	58	17	sw/ne	PC	Recreation
		Lower Pine Creek	YL	21	58	17	nw/se	C	Recreation
		Ice Box Canyon	YL	21	58	9	nw/nw	PC	Recreation
		Brown Stone Res	YL	20	58	25	nw/nw	C	Recreation
		White Rock Sp.	YL	20	58	33	ne/ne	C	Recreation
		Bootleg Sp.	YL	22	58	7	se/se	C	Burros, Recreation

TABLE .46-7 (continued)
Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1)		Location				Bighorn(2) Use	Obvious Conflict
			Classif.	T	R	S	1/4	1/4		
		Rainbow Sp.	S	22	58	7	se	ne	PC	Burros, Recreation
		Switchback Sp.	YL	21	57	12	sw	ne	PC	Recreation
		LaMadre Sp.	YL	20	58	29	se	nw	C	Recreation
		Mule Sp.	YL	22	57	15	sw	sw	PC	Burros
		Cave Sp.	YL	21	57	8	se	se	PC	
		C-C Sp.	YL	21	57	9	ne	nw	PC	Burros
		Sheep Sp.	YL	20	57	36	sw	sw	C	
		Cave Sp.	S	20	57	33	ne	sw	PC	Livestock
		Claybank Sp.	YL	20	57	35	nw	sw	C	Recreation
		Clay Basin	S	20	57	35	sw	ne	PC	
		Coal Sp.	S	20	57	31	se	se	PC	
		Roses Sp.	YL	20	57	7	nw	ne	PC	
		Center Sp.	YL	20	57	28	ne		PC	Livestock, Burros, Recreation
		Narrow Sp.	YL	20	57	27	ne	nw	C	
		Timber #2 Sp.	S	20	57	29	sw	ne	PC	
		Timber #3 Sp.	YL	20	57	20	nw	se	PC	
		Lost Creek	YL	21	58	4	ne	nw	PC	Recreation
		South Fork Sp.	YL	20	57	36	se	se	C	Recreation
		Red Sp.	YL	21	59	7	nw	nw	PC	Recreation
		Lost Cabin Sp.	YL	21	56	36	nw	nw	PC	
		Cave Sp. #2	S	20	57	33	nw	se	PC	Recreation
		Unknown Seep #2	YL	21	57	5	se	se	PC	
		Willow Sp.	YL	20	58	33	sw	sw	PC	Recreation
		South Sp.	S	21	57	25	se	sw	PC	
		Seep	S	21	57	19	nw	nw	PC	
		S. Rose Sp.	YL	21	57	18	ne	ne	PC	
		Sandstone Seep #2	S	22	58	5	ne	ne	PC	
		Seep	S	21	57	1	nw	se	PC	Recreation
		Spring	S	20	57	36	se	ne	PC	
		Timber #1	S	20	57	29	nw	ne	PC	
		Claybank #2	YL	20	57	25	nw	sw	PC	
		Claybank #3	YL	20	57	26	sw	ne	PC	
North Sp. Mt.	4444	Timber #4	YL	20	57	20	se	nw	PC	
		Seep	YL	21	57	1	sw	ne	PC	
		Spring	S	20	57	33	se	se	PC	
		Spring	YL	21	58	8	nw	nw	PC	
		Seep	YL	21	57	8	ne	sw	PC	
		Seep	YL	20	57	26	sw	sw	PC	Livestock
		Seep	YL	21	57	18	ne	nw	PC	

TABLE .46-7 (addition)

Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water (1) Classif.	Location						Bighorn (2) Use	Obvious Conflict
				T	R	S	1/4	1/4			
Arrow Canyon	2007	Guzzler #1	YL	16 S	63 E	11	SE/NW			C	
				18 S	67 E	32	NW/SW			PC	
Muddy Mtns	2026	Slack Rock H ₂ O Dev	YL								
				18 S	67 E	29	NE/NE			PC	
Muddy Mtns	2026	E White Basin Res.	YL								
				19 S	59 E	32	SE/NW			PC	
North Spring Mtn.	unallotted	Red Rock Guzzler #3	YL							PC	
Spring Mtn	unallotted	Upper Mud Sp.	YL	22 S	58 E	14	NW/NE			PC	
Spring Mtn	unallotted	Mud Sp.	YL	22 S	58 E	14	NE/SW			PC	
Spring Mtn	unallotted	Grapevine Sp.	YL	22 S	58 E	22	NE/SE			PC	

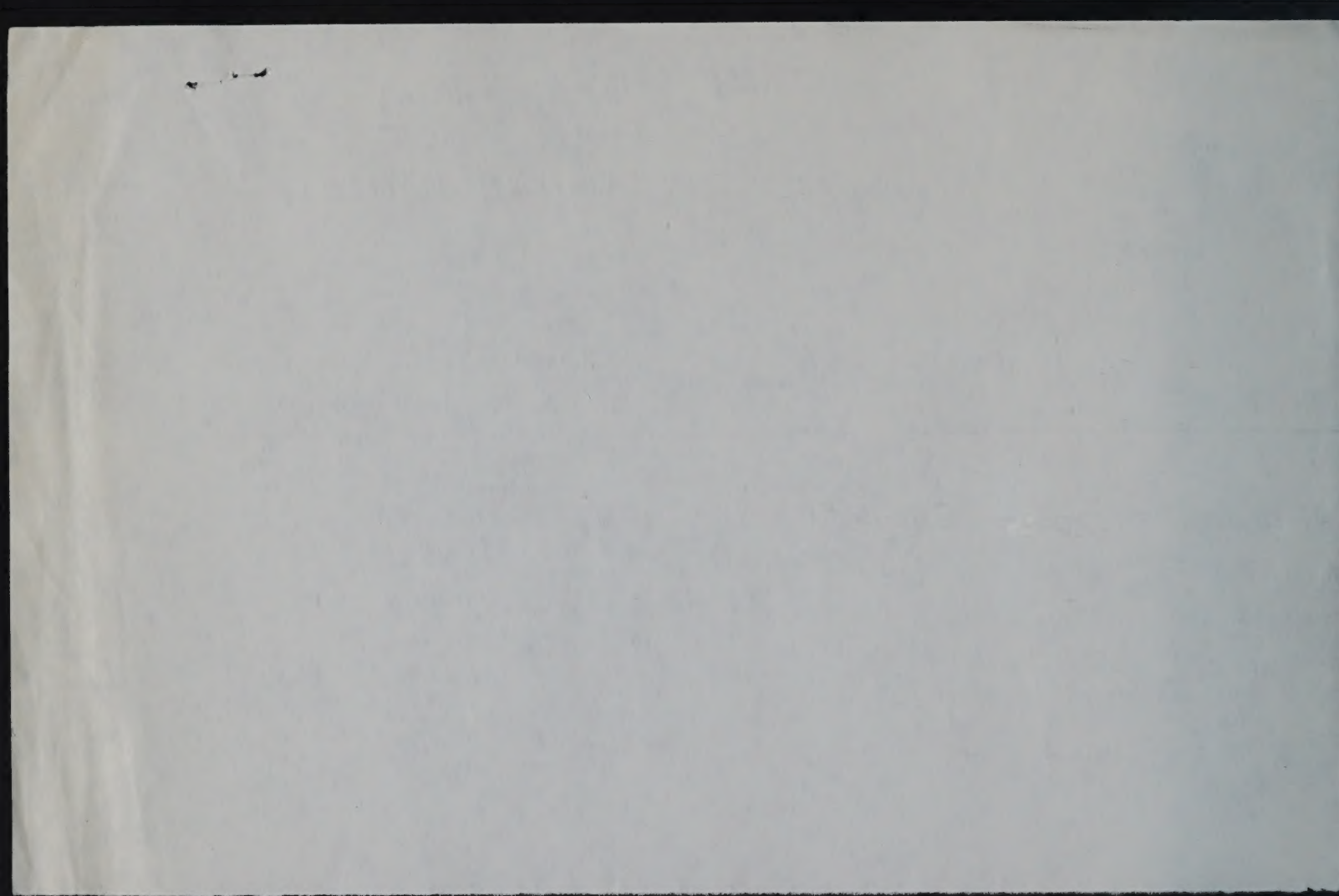


TABLE .46-7 (continued)
Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1) Classif.	T	Location R S 1/4/1/4				Bighorn(2) Use	Obvious Conflict
		Seep	S	20	57	36	ne/se	PC		
		Seep	S	21	57	5	se/ne	PC		
		Spring	YL	21	57	5	sw/se	PC		
		Upper Sandstove Sp.	YL	22	58	5	nw/se	C		
		Seep	YL	22	58	16	ne/ne	C		
		Seep	S	22	58	15	nw/sw	PC		
		Seep	YL	22	58	22	ne/nw	C		
		Spring	YL	20	56	14	ne/nw & sw/sw	PC		
		Seep	unk	21	58	8	nw/sw	PC		
		Pine Sp.	YL	21	58	20	nw/nw	C		
		LaMadre N.	S	20	58	20	se/sw	PC		
		LaMadre W.	S	20	58	29	nw/sw	PC		
		Spring	unk	21	57	1	ne/se	PC		
		Seep	unk	20	57	36	se/nw	PC		
		Seep	unk	20	57	35	ne/se	PC		
		Seep	YL	20	56	22	ne/se & se/ne	PC		
		Seep	YL	20	56	14	sw/sw	PC		
Meadow V.		No Sources								
Arrow Canyon		No Sources								
Muddies	NPS	Blue Pt. Sp.	YL	18	68	6	sw/se	PC	Recreation	
		— Unnamed Sp. #3	YL	18	67	13	sw/nw	C	Burros use water	
		Rogers Sp.	YL	18	67	12	se/se	PC	Recreation	
Mormon		No Sources								
N. Muddies		No Sources								
Virgin Mtns	2005	N. Key West Sp.	YL	15	70	16	se/se	PC	Livestock use in area	
		S. Key West Sp.	S	15	70	21	sw/ne	PC	Livestock	
		Govt Sp.	YL	15	70	9	sw/nw	PC	Livestock	
		— Seep Sp.	YL	15	70	2	se/se	C	Livestock	
		Black Butte Catchment	S	16	70	32	ne/sw	PC	Livestock	
		Dud Sp.	YL	15	70	12	ne/sw	PC	Livestock	
		Red Rocks Sp.	YL	15	70	8&18		PC	Livestock	
		Unnamed Sp. #1	unk	15	69	15	ne	PC		
		Jump Sp.	YL	15	70	14	nw/se	PC		
		Dud Sp. Trough	YL	15	70	12	nw	PC		
		Juanita Sp.		15	69	14	ne/nw	PC		
		Key West Mine		15	70	21	se/ne	PC		
		Gr. Eastern Mine		15	70	14	sw/sw	PC		

TABLE .46-7 (continued)

Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1) Classif.	Location				Bighorn(2) Use	Obvious Conflict
				T	R	S	1/4/1/4		
		White Rock Sp.	YL	15	71	19	nw/nw	PC	
		Black Rock Sp.	YL	15	71	19	ne/nw	PC	
		Unnamed Sp. #2		15	70	24	nw/ne	PC	
		Unnamed Sp. #3		15	70	24	nw/ne	PC	
	2011	Cottonwood Sp.	YL	15	71	9	se/nw	PC	Livestock
		L. Nickle Sp.	YL	15	71	18	ne/se	PC	
		Hen Sp.	YL	15	71	6	ne	PC	Livestock
		Cedar Sp.	unk	15	71	17	sw/ne	PC	
		Unnamed Sp.	unk	15	71	9	ne/sw	PC	Livestock, Recreation
	2015	Spring #1-	unk	15	71	4	nw/nw	PC	
		Spring #2	unk	15	71	4	se/sw	PC	
		Wiregrass	YL	15	71	16	ne/se	PC	
		Unnamed #1	unk	15	71	16	se/se	PC	
		Big Sp. #1	YL	15	71	21	sw/nw	PC	
		Big Sp. #2	unk	15	71	20	se/ne	PC	
		Cabin Canyon Trough		14	71	33	sw/ne	PC	
		Spring #3		14	71	33	sw/sw	PC	
	2012	Lime Sp. #1	YL	15	71	33	se/se	PC	
		Lime Sp. #2	YL	15	71	33	sw/ne	PC	
		Indian Sp.	unk	15	71	34	ne/sw	PC	
		Unnamed #1	unk	15	71	28	se/sw	PC	
		Unnamed #2	unk	15	71	28	se/sw	PC	
		Unnamed #3	unk	15	71	28	se/ne	PC	
	2010	Red Bluff Sp.	YL	17	69	14	nw	C	Sheep
	2004	Sam's Sp.	unk	16	71	17	nw/se	PC	
		Cabin Sp.	YL	16	71	17	ne/se	C	Livestock
		Whitney Pockets	S	16	70	23	sw/se	PC	Livestock, Vehicle Traffic
		House Sp.	YL	16	71	21	ctr.	PC	Livestock
		Wecheche Sp.	S	16	71	21	nw/sw	PC	Livestock
		South Sp.	YL	16	71	34	ne/sw	PC	Livestock
		Rattlesnake Sp.	YL	16	71	28	nw/sw	PC	Livestock
		Big Sp.	YL	16	71	22	ne/sw	PC	Livestock
		Pussywillow	unk	16	71	33	se/nw	PC	
		Unnamed	unk	16	71	33	nw/nw	PC	
		Billy Goat	YL	16	71	33	se/nw	PC	
		Billy Goat Tank	S	16	71	29	nw	PC	Livestock
		Cabin Sp. P.L. -		16	71	19	sw/nw	PC	Livestock
		Trough 3							
		House Sp.		16	71	20	ne/sw	PC	Livestock
		P.L.-Trough							

TABLE .46-7 (continued)
Clark County

WATERS IN BIGHORN HABITAT

Mtn. Range	Allot.	Source Name	Water(1) Classif.	Location				Bighorn(2) Use	Obvious Conflict
				T	R	S	1/4/1/4		
Gold Butte	2010	House Sp.		16	71	29	nw	PC	Livestock
		P.L. Trough							
		Billy Goat P.L.		16	71	21	sw	PC	Livestock
		Trough							
		Cabin Sp.		16	71	19	ne/ne	PC	Livestock
		Trough 2							
		Unnamed Sp.		16	71	8	sw/nw	PC	Livestock
		Summit Sp.	S-YL	19	71	18	nw	PC	
		Willow Sp. P.L.	unk	20	69	2		PC	Livestock
					70	8			
		Twin Sp.	S	20	70	19	sw/se	PC	
		Turkey Sp.	S	20	69	24	nw	PC	
		Fairbank Sp.	S	20	69	3	sw/se	PC	
		Gann Sp.	S	20	69	15	ne/sw	PC	
		Connelly Sp.	YL	19	71	31	se/ne	PC	Livestock Burros
		Perkins Sp.	S	19	69	1	ne/ne	PC	
		Horse Sp.	YL	18	70	24	se/nw	PC	Livestock
		New Sp.	S-YL	19	71	29	sw/sw	PC	Livestock
		Granite Sp.	S	19	70	17	ne/sw	PC	
		Ruby Basin Sp.	YL	20	69	25	nw/nw	PC	
		Walker Sp.	YL	20	69	21	se/nw	PC	
		Jumbo Sp.	S	20	70	3	se/sw	PC	
		Quail Sp.	S	19	69	22	ne/sw	PC	
		Red Bluff	YL	17	69	14	nw	PC	
		Falls Sp.	S	19	70	32	sw	PC	Livestock
		Julies Sp.	YL	19	71	6	se	PC	Livestock
		Grapevine Sp.	YL	19	70	34	sw/nw	PC	Livestock
		Garden Sp.	YL	19	70	11	ne/nw	C	Livestock
		Boulder Sp.	YL	20	70	20	se	PC	
		Cedar Basin Well	YL	19	70	28	sw	PC	
		Dugway	S	20	70	32	sw	PC	
		Goat Sp.	YL	19	69	36	se	PC	
		Hidden Sp.	YL	20	69	15	nw	PC	
		Lower Pierson Sp.	S	20	70	1	sw/nw	PC	
		McKenna Mine	YL	19	70	27	sw	PC	
		Natural Sp.	S	20	69	1	nw	PC	
		Upper Pierson	YL	20	70	35	sw	PC	
		Cottonwood Sp.	YL	20	70	13	se	PC	
Black Mtns.	2016	Unnamed	S	20	66	17	se/sw	PC	
	2026	Sandstone Sp.	S	20	66 1/2				
						18	se/nw	PC	

(1) Yearlong - Seasonal - Unknown

(2) Crucial - Potential Crucial

TABLE .46-8

ACRES OF SIGNIFICANT BIGHORN - LIVESTOCK AND HORSE/BURRO
RESOURCE USE CONFLICTS

Mountain Range	Conflict		Acres
	Livestock	Horse/Burro	
<u>Current</u>			
Highland	X		13,500
McCullough	X	X	48,700/10,000
Eldorado		X	49,700
NY/Castle/Piute	X		20,239
Bird Spring		X	19,110
So. Spring		X	8,000
Red Rock/LaMadre		X	4,400
Black		X	6,200
Muddy		X	10,300
Virgin	X		9,700
Gold Butte	X		7,100
<u>Historic</u>			
Newberry	X		1,100
No. Spring	X	X	44,200/55,700
Virgin	X	X	2,500
Gold Butte	X	X	33,600/27,900

TABLE .46-9
Clark County

Bighorn Sheep Harvest Summary ¹

Mtn. Range	Year				
	1979	1978	1977	1976	1975
Highland	Closed	1	0	1	2
McCullough	2	0	1	3	0
Eldorado	6	5	6	3	3
Newberry	2	1	0	0	0
Bird Spring) South Spring) Red Rock/LaMadre)	1	1	1	1	2
Stateline Total	11	8	8	8	7
Black	3	4	4	6	4
Muddy	3	1	2	3	0
Arrow Canyon	4	0	0	0	1
Mormon	0	0	0	0	0
Meadow Valley	0	0	1	0	0
Virgin Valley Total	10	5	7	9	5

¹ Data from Nevada Department of Wildlife files.

TABLE .46-10

Clark County

DEER YEARLONG HABITAT

Virgin Valley Planning Unit

Mountain Range	Overlay Symbol	Acres	Present Population Estimate	*Reasonable Number Estimate	Present Total Deer Forage Capacity (AUMS)	Reasonable Number Forage Require- ment (AUMs)
Virgin Mtns.	DY-2	32,402	100	300	1,920	900
Gold Butte Area	DY-3	23,007	50	50	199	150

Stateline Planning Unit

Spring Mountains	DY-1	376,601	500	1,500	6,512	4,500
McCullough Range	DY-4	38,473	50	50	1,454	150
Newberry Range	DY-5	18,581	50	50	493	150

DY1 - 201,600 went to FS ⁽¹⁹⁸⁹⁾ = 175,000 ac left on BLM (~37,900 w/water)

* Reasonable number estimates are "considered long-term averages or goal levels that could be achieved through proper management techniques" by Nevada Department of Wildlife.

TABLE .46-11

Virgin Valley Planning Unit

DEER HABITAT BY GRAZING ALLOTMENT

Deer Range	Grazing Allotment	Acres of Deer Habitat in Allotment	Percent of Habitat Located in Allotment	Present Total Perennial Deer Forage Capacity (AUMs)
Virgin Mountains	Billy Goat Peak	10,470	32	131
	Bunkerville	5,545	17	502
	Hen Springs	4,269	13	300
	Lime Spring	2,384	7	91
	Mesquite Community	9,734	31	896
Gold Butte Area	Gold Butte	23,007	100	199

TABLE .46-12

Stateline Planning Unit

DEER HABITAT BY GRAZING ALLOTMENT

Deer Range	Grazing Allotment	Acres of Deer Habitat in Allotment	Percent of Habitat Located In Allotment	Present Total Deer Forage Capacity (AUMs)
Spring Mountain	Kyle Canyon	22,672	6	101
	Lucky Strike	94,523	25	1,446
	Spring Mountain (Unallotted)	98,720	26	2,149
	Table Mountain	1,184	1	41
	Yount Springs	8,276	2	36
	Wheeler Wash	84,051	22	1,494
	Wheeler Slope (Unallotted)	51,234	14	774
	Unallotted Area (3333)	12,330	3	443
	Unallotted Area (7777)	3,611	1	28
McCullough Mtn.	Jean Lake	18,903	49	353
	McCullough	19,570	51	1,101
Newberry Mountain	Christmas Tree	8,546	46	103
	Newberry	10,035	54	390

TABLE 46-13
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of	Date of	Evidence of	Water Available	Comments
	T.	R.	Sec.	1/4	Flow	Inspection	Development	At Source	
	(south)	(east)							
ACTON-FARRIER ALLOTMENT									
Lewis Reservoir	13	65	33	NW		1/25/79		Yes	Available to wildlife
Guzzer P-1	13	64	10	SE		1982	Yes		
ARROW CANYON ALLOTMENT									
Perkins Well	13	63	11	NW		1/24/79		No	No storage facilities, not available to wildlife
Pahrnagat Wash Reservoir	13	63	14	SW		1/24/79		Yes	Available to wildlife
Perkins #1 Reservoir	13	63	27			9/12/79		No	Dry, needs rebuilding, 3/4 mile from good bighorn habitat
Moapa Reservoir	13	63	26	SW		9/12/79		No	Dry
Upper Tamarix Reservoir	14	65	20	SE		9/17/79		Yes	Heavy livestock use
Lower Tamarix Reservoir	14	65	21	NW		9/17/79		Yes	Heavy livestock use
Guzzer P-2	13	64	22	SE		1982	Yes		
BILLY GOAT PEAK ALLOTMENT									
Whitney Pocket Catchment	16	70	23	SE		6/21/79		Yes	Float valve and bird ladder needed. H ₂ O not available to large mammals, trough and pipeline need cleaning.
Cabin Spring Pipeline	16	71	19,			4/12/79		No	Need bird ladders, could be reconstructed
Camp Reservoir	16	71	18	NW		4/12/79		Yes	

TABLE .46-13 (continued)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location			Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4					
House Spring Pipeline	16	71	21,20, 29,30		2 gpm	4/24/79		Bird ladder needed at middle trough Sec. 29
Wecheche Spring	16	71	21	SW	2 gpm	4/24/79	Yes	Metal trough needs bird ladder
South Spring	16	71	34	SW	2 gpm	4/24/79	Yes	Bird ladder needed. Headbox and troughs need to be cleaned.
Rattlesnake Spr.	16	71	28	NW		6/6/79	No	Heavy cattle use
Big Spring	16	71	22		Stream 1/2 Mile	6/6/79	Yes	No apparent conflicts
BUNKERVILLE ALLOTMENT								
Nickle Wash Stream	15	70	14	SE	200 gpm	6/20/79	Yes	Appears to run about 5 miles
North Key West Spring	15	70	16	SE	1/2 pint/min	6/20/79	Yes	Needs wildlife drinker outside corral. Needs bird ladder in trough. Heavy live-stock use.
South Key West Spring	15	70	21	NE	Not dry unable to estimate flow	6/20/79	Yes	No Needs bird ladder in trough and Wildlife drinker outside corral
Rabbit Spring	15	70	9	NW	2.4 gpm	6/14/79	Yes	No Some cattle use.
Seep Spring & Pipeline	14, 15	70	34,27, 23,14, 3,2		1 gpm	3/5/79	Yes	Unknown Has 4 troughs all need bird ladders, last 3 troughs dry, 1st trough inside corral, needs wildlife drinker above 1st trough
Seep Spring	15	70	2	SE	5 gpm	3/8/79	Yes	Yes Heavy livestock use
Cement Catchment	16	70	32	SW	0	10/17/79	Yes	Could be improved by deepening and lining with cement
Dud Spring & Trough	15	70	12	NW	6 gpm at Spring Source		Yes	Bird ladder needed in trough
Red Rock Springs #1,2,3,4	17	70	7,18		1/4 gpm each except #1 no flow	8/29/79	No	Yes Heavy livestock use at times

TABLE 46-13 (continued)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of	Date of	Evidence of	Water Available	Comments
	T.	R.	Sec.	1/4	Flow	Inspection	Development	At Source	
	(south)	(east)							
DRY LAKE ALLOTMENT									
Dry Lake Reservoir & Ditches	17	63	13	SE	Water Present	12/28/78			
Dry Lake Reservoir #2	17	63	19	SE	Water Present	12/28/78			
Guzzler #1	16	63	11	NW					Available to wildlife Apron reconstructed
FLAT TOP MESA ALLOTMENT									
Flat Top Mesa Well	13	70	26	NW		4/26/79			Water unavailable to wildlife
GLENDALE ALLOTMENT									
Perkins Well #3	14	66	15	SE		2/06/79			Water unavailable to wildlife
Perkins Tank	14	66	15	SE		2/06/79			Dry
Unnamed Well	14	66	4	SE		2/06/79			Dry
GOLD BUTTE ALLOTMENT									
Summit Spring	19	71	18	NW	0	8/31/79	No		Just a seep, Julies Spring nearby
Taylor Water Development	20	69	15	NW	Seep	3/21/79	Yes	Yes	Heavily trampled by livestock, Redevelop and fence source
Willow Spring Pipeline	20	69	12		2 gpm	3/20/79	Yes	Yes	Source trampled by livestock, 2 30' diameter tanks need bird ladders, fence source
		70	7,8						
Twin Spring Pipeline	20	70	19	SE	15 gpm	3/22/79	Yes	Yes	Protect source, bird ladder needed in trough
Turkey Spring	20	69	24	NW	Dry	3/22/79	Yes	No	Could be redeveloped
Fairbanks Spring	20	69	3	SE	1 gpm	3/20/79	yes	Yes	Protect for wildlife use, re-develop and provide water to livestock away from source

TABLE .46-13 (continued)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec.	1/4					
Gann Spring	20	69	15	SW	5 gpm	3/21/79	No	Yes	Protect source from livestock trampling.
Greasewood Basin Reservoir	17	71	33	SW	Dry	4/3/79			
Connolly Spring	19	71	31	NE	2 gpm	6/21/79	Yes	Yes	Protect source and pipe water to trough. Heavy livestock and burro use.
Cedar Basin Reservoir	19	70	34	NW	Water Present	3/21/79			
Perkins Spring	19	69	1	NE	1/2 gpm	4/5/79		Yes	Spring is fenced. Should be modified to allow access to large animals.
Lime Reservoir	19	69	12	NW	Dry	4/10/79			
Horse Springs	18	70	24	NW	Undetermined	6/21/79	Yes	No	Trough needs bird ladder.
Bills Spring	19	70	10	SW	Dry	6/21/79	Yes	No	Dry, redevelop spring
New Spring	19	71	31		Less than 1/2 pint/min	6/21/79	Yes	Yes	Needs bird ladder in trough Protect source.
Granite Spring	19	70	9	SE	Undetermined	4/4/79	Yes	Yes	Trough needs bird ladder.
Gold Butte Well	19	70	17	SW		6/21/79			Well has water 30 ft. below surface, presently not available to any animals.
Cottonwood Spring	20	70	14	SE	25 gpm		No	Yes	Water available to all animals
Mud Spring Reservoir	17	70	25	SE		4/25/79			Dry
Maynard Spring	19	69	20	SE	2 gpm	9/6/79	Yes	Undetermined	
Ruby Basin Spring	20	69	25	NW	1 gpm	4/3/79	Yes	No	Trough needs bird ladder, cover at headbox needs repair.
Catclaw Spring	19	69	29	SW	1 gpm	4/4/79	Yes	No	Trough needs bird ladder.
Walker Spring	20	69	21	NW	5 gpm	4/3/79	Yes	No	Drinker at source needed for wildlife, trough needs bird ladder.
Jumbo Spring	20	70	19	NE	3 gpm	3/22/79	Yes	Yes	Troughs need bird ladders, Headbox and troughs need cleaning.

TABLE 46-13 (continued)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
GOLD BUTTE ALLOTMENT									
Quail Spring	19	69	22	SW	1 gpm	4/12/79	Yes	Yes	
Red Bluff Spring	17	69	14	NW	5 gpm	4/12/79	No	Yes	
Aqua Chiquita Spring	19	69	30	SW	1 gpm	4/4/79	Yes	Yes	
Falls Spring	19	70	33	NW	Dry	8/29/79	Yes	No	
Julies Spring	19	71	6	SE	1.25 gpm	8/31/79	No	Yes	
Grapevine Spring	19	70	34	SW	Undetermined	8/31/79	Yes	Yes	Heavy livestock use
Mockingbird Spring	19	69	21	SW	Dry	9/6/79	Yes	No	Provide yearlong water source.
Garden Spring Well	19	70	11	NW	5 gpm	9/6/79	Yes	Undetermined	30' diameter trough needs bird ladder
Twin Spring Wash	20	69	24		20 gpm	6/20/79	No	Yes	Develop spring to provide water longer in the year.
	20	70	19,20						
HEN SPRING ALLOTMENT									
Hen Spring Reservoir	14	71	31	SE	Dry	4/2/79			
Hen Spring Water Storage	14	71	15	SW	Dry	8/28/79	Yes	No	
Cabin Canyon Spring #1	15	71	9	SW	12-15 gpm	8/29/79	Yes	Yes	
Cement Tank & Trough	14	71	5	NW	Dry	8/1/79	Yes		
JACKRABBIT ALLOTMENT									
Mesquite Reservoir	13	71	5	NE	Dry	3/27/79			

TABLE .46-13(continued)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
LIME SPRINGS ALLOTMENT									
Lime Spring #2	15	71	21	NW	50 gpm	6/6/79		Yes	
Lime Spring	15	71	33	SE	25 gpm	6/6/79		Yes	
LOWER MORMON MESA ALLOTMENT									
Freighter Reservoir	15	68	3	SE		2/26/79			Water available, 1' deep, 50' x 50'.
Cross Roads Reservoir	14	68	22	SE		2/26/79			Water available 2' deep 50' x 50'.
Unnamed Reservoir	14	68	32	SW	Dry	2/26/79			
Old Adams Reservoir	14	67	13	NE	Dry	2/14/79			
Beacon Reservoir	14	68	25	NE	Dry	2/14/79			
Lower Monmon Mesa Reservoir #1	14	68	7	SW		2/14/79			Water available 1' deep 75' x 50'
Lower Monmon Mesa Reservoir #2	14	68	6	SE	Dry	2/13/79			
MESA CLIFF ALLOTMENT									
Bowman Reservoir	15	67	14,15, 22			6/21/79			160 Acres in Surface area, 10' deep, State land.
MESQUITE COMMUNITY ALLOTMENT									
Cabin Canyon Spring #2	15	71	4		10 gpm	8/29/79		Yes	

TABLE .46-13 (continued)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
Cabin Canyon Pipe- line, Water Tank	14	71	33		1 gpm	8/29/79			Trough dry, 1 gpm leak in pipe- line near trough and corral.
MUDDY MOUNTAIN ALLOTMENT									
Buffington Pockets Reservoir	18	65	14	SE	Dry	6/22/79			Repair hole in bottom
Searles Reservoir	18	65	19	SW	Dry	12/21/78			Abandoned.
Searles Well	16	65	33	NE		10/28/78			
Crystal Reservoir	17	64	11	SE	Dry	12/28/78			Well is inoperable Well not utilized, appears inoperable
Muddy Mountain Well	18	64	25	NE		12/21/78			
West Well	17	65	31	SE		12/29/78			
PITTMAN WELL									
Powerline Flat Reservoir	16	63	9	SE	Dry	1/17/79			Appears not to have been used in many years.
Highway 93 Reservoir	17	63	29	SE	Dry	1/23/79			
Hidden Valley Well	16	63	8	NW	Dry	1/19/79			
Pittman Well	16	63	9	SE	Dry	9/12/79			
ROX ALLOTMENT									
Unnamed Tank	13	66	32	SE		2/7/79			Needs bird ladder
Unnamed Water Haul	13	66	16	SE		2/8/79			Needs bird ladder
Perkins Well #2	13	66	29	NE		9/17/79			Needs bird ladder in trough.

TABLE .46-13 (Continued)
Virgin Valley Planning

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
SUNRISE ALLOTMENT									
Gypsum Spring	20	63	14	SW	1 gpm	1/2/79			
Gypsum Reservoir	20	64	18	NE	Dry	1/2/79			
Sheep Reservoir	13	69	12	SW	Dry	4/18/79			
Toqoup Wash Well	13	70	4	SW		3/7/79			30' diameter trough full, needs bird ladder
UPPER MORMON MESA ALLOTMENT									
Tortoise Reservoir	13	67	1	SE	Dry	2/7/79			
Material Site	14	68	6	SW	Dry	2/12/79			
Cement Tank & Reservoir									
Sheep Canyon Reservoir	13	67	14	NW	Dry	2/7/79			
Upper Mormon Mesa Reservoir #1	13	68	32	SE	Dry	2/8/79			
Cement & Galvanized Iron Tank	14	67	1	NW		9/14/79			Water Haul, Needs bird ladder.
UTE ALLOTMENT									
Hogan Spring	15	65	11	SW	1 gpm	1/23/79	Yes	Yes	
WHITE BASIN ALLOTMENT									
Sandstone Spring	20	66 1/2	18	NW	No visible Flow	3/1/79	Yes	Yes	

TABLE .46-13 (addition)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location T R (south) (east)	Sec.	1/4	Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
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ARROW CANYON

Guzzler P-3	13	64	27	SW	1982	Yes		
Guzzler P-4	13	64	33	SE	1982	Yes		
Guzzler P-5	14	64	4	SE	1982	Yes		
Guzzler P-6	13	64	32	NW	1982	Yes		
Guzzler P-7	13	64	31	SW	1982	Yes		
Guzzler P-9	13	63	25	SE	1982	Yes		
Guzzler P-10	13	63	26	NE	1982	Yes		
Guzzler P-11	13	63	26	SW	1982	Yes		
Guzzler P-13	13	63	23	NW	1982	Yes		
Guzzler P-14	13	63	11	SW	1982	Yes		
Guzzler P-15	13	63	3	NE	1982	Yes		

GOLD BUTTE

Guzzler GB-12	19	69	26	SE		Yes		
Guzzler GB-13	19	70	30	SW		Yes		
Guzzler GB-14	19	69	26	SE		Yes		
Guzzler GB-15	19	69	36	NE		Yes		
Guzzler GB-16	19	70	31	SW		Yes		
Guzzler GB-17	19	69	33	SE		Yes		
Guzzler GB-18	20	69	5	NE		Yes		
Guzzler GB-19	20	69	6	NE		Yes		
Guzzler GB-20	20	69	1	SE		Yes		
Guzzler GB-21	20	70	7	NE		Yes		

TABLE .46-13 (addition)
Virgin Valley Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T (south)	R (east)	Sec.	1/4					

GOLD BUTTE

Guzzler GB-22	20	69	11	SE			YES	
Guzzler GB-23	20	69	23	NE			YES	
Guzzler GB-24	20	69	26	NE			YES	
Guzzler GB-25	20	69	36	NE			YES	
Guzzler GB-26	19	69	34	NW			YES	
Guzzler GB-27	19	70	19	SE			YES	
Guzzler GB-28	19	70	29	SE			YES	
Guzzler GB-29	20	70	4	NW			YES	
Guzzler GB-30	18	70	26	SW			YES	

BUNKERVILLE

Guzzler V-1	15	70	15	NW			YES	
Guzzler V-2	15	70	9	SE			YES	

TABLE .46-13 (Continued)
Virgin Valley Planning

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
Bitter Spring	19	67	16	NW	5 gpm	3/13/79	No	Yes	
Unamed Spring #1	19	67	18	NW	1/2 pt/min	6/21/79	No	Yes	
Roger's Spring	18	67	12	SE	500 gpm	6/21/79	Yes	Yes	Heavy recreational use, Pool 75' x 75' x 3' NPS land.
Blue Point Spring	18	68	6	SE	25 gpm	6/21/79	No	Yes	NPS land.
Unnamed Spring #2	18	68	19	NW	5 gpm	3/15/79	No	Yes	NPS land.
East White Basin Reservoir	18	67	29	NE	Dry	3/14/79			Improvements made 5/10/85
Unnamed Spring #3	18	67	13	NW	5 gpm	6/21/79	No	Yes	NPS land.
Unnamed Spring #4	17	68	31	SE	1 gpm	3/15/79	No	Yes	
Muddy Mts Water Dev.	18	67	32	SW		6/6/85	Yes	Yes	Water available to wildlife

TABLE .46-14
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of	Date of	Evidence of	Water Available	Comments
	T.	R.	Sec.	1/4	Flow	Inspection	Development	At Source	
	(south)	(east)							
BLACK BUTTE ALLOTMENT									
Government Well	25	57	36	NW	None	5/3/79			Develop well to provide yearlong water source.
Well Site at Addison Mine	26	58	8	NE		5/17/79			Dry.
CHRISTMAS TREE PASS ALLOTMENT									
Roman Spring	31	65	4	NE	1 gal/min	4/26/79	Yes	Not always	Make water available to wildlife yearlong.
Yellowstone Spring	31	65	4	SE	3/4 gal/min	4/19/79	Yes	Yes	<u>Fence spring source.</u>
CRESCENT PEAK ALLOTMENT									
Six Mile Well	29	63	7	SE		4/27/79			Install wildlife drinker outside corral, cover storage tank.
Water Tank #1	29	62	4	NE		4/27/79			Trough needs bird ladder, drinker outside corral needed, cover storage tank.
Water Tank #2	29	62	9	NW		4/27/79			Trough needs bird ladder, drinker outside of corral needed.
Water Tank #3	29	62	31	NW		4/27/79			Troughs need bird ladders, drinker needed outside corral.
Crescent Spring	28	61	29	SW	1 qt/min	4/27/79			Drinker outside of corral needed, develop to make water available yearlong.

TABLE 46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec.	1/4					
Water Trough	31	63	3	SE		6/6/79			Bird ladder needed.
Double Trough	30	63	35	NW		6/6/79			Bird ladder needed.
Ten Mile Well	30	63	10	SW		6/6/79			Troughs need bird ladders, and drinker placed outside of corral.
Clarks Well	28	61	36	SW		5/31/79			Needs bird ladder in trough, storage tank needs to be covered.
Water Trough	29	63	34	NE		6/6/79			Bird ladder needed.
Hopps Well	28	61	25	SE	1 qt/min	9/18/79			
HIDDEN VALLEY ALLOTMENT									
Hidden Valley Reservoir	24	61	32	NW		5/9/79			Had water present.
Well Site	25	61	5	NW	Capped	5/9/79			Possibly redevelopment could make water available.
Water Tanks	24	61	21	NW		5/9/79			Bird ladders needed.
Hidden Valley Well	24	61	20	SE	Capped	5/9/79			
Water Catchment #2	24	61	2	SW				Yes	After tanks are filled water will be available year long.
IRETEBA PEAKS ALLOTMENT									
Boat Tank Spring	28	64	32	NE	1.5 gal/min	6/15/79	Yes	No	Bird ladder needed.
Summit Springs	28	64	31	SE		6/8/79	Yes	No	Water unavailable, need to redevelop.
Well	28	64	31	NW		6/8/79			Water unavailable to wildlife.
Tip Top Well	29	64	19	SE		4/26/79			Water unavailable to wildlife.
Water Haul	29	63	13	SW		4/26/79			Bird ladders needed.

TABLE .46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location			Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4					
Jona Spring	27	64	13,14	15 gal/min	6/11/79		Yes	
Unnamed Spring	27	64	12 NE	20 gal/min	6/11/79	No	Yes	Develop area for permanent water supply.
Unnamed Spring	27	64	14 NE	10 gal/min	6/11/79	No	Yes	Develop catchments to collect water for dry season use.
Wash Spring	26	65	6 SE	2 gal/min	6/8/79	No	Yes	
Knobhill Spring	26	64	29 N1/2	1 pt/min	6/6/79	No	Yes	Develop to provide yearlong water source.
Mine Well	26	64	1 SW		6/8/79			Water 25' below surface, unavailable to wildlife.
Water Haul	27	63	11 SW		6/1/79			Needs bird ladders.
Well Site	26	63	13 SE		6/6/79			Dry.
Mine Site #2	26	64	10 NE		5/31/79			Abandoned mine shaft is filling with water.
Mine Site #1	26	64	4 SW		5/31/79			Potential exists to provide water to wildlife.
Tule Seep	26	64	28 SE	None	6/6/79	No	Yes	Develop to provide yearlong water.
Desert Queen Well	26	63	13 SW		6/6/79			Water trough needs bird ladder, no access for large mammals.
Seep & Catchment	25	64	34 SW		6/8/79	No	Yes	Could be developed to provide yearlong water.
Unnamed Spring	26	64	8 NE	1 qt/min	6/8/79	No	Yes	Develop water source for wildlife away from road.
Huse Spring	26	64	11 NW	20 gal/min	5/31/79	No	Yes	Resident indicates stream dries up by mid summer.
Bridge Spring	25	64	34 SE	1 pt/min	6/8/79	No	Yes	Develop to provide yearlong water.
Tule Well	26	64	28 NW		6/1/79			Water unavailable to wildlife.
Well	26	64	4 SW					Water unavailable to large mammals.

Table 46-14 (addition)
Stateline Planning Unit

Allotment	Location		Sec.	1/4	WILDLIFE Amount of Flow	WATER Date of Inspection	INVENTORY Evidence of Development	SUMMARY Water Available At Source	Comments
	T (South)	R (East)							

IRETEBA PEAKS
ALLOTMENT

Searchlight Guzz 2	29	64	20	NW		1971	YES	
Searchlight Guzz 3	28	63	26	SW		1971	YES	
Searchlight Guzz 4	28	64	29	SW		1970	YES	
Searchlight Guzz 5	28	64	33	NW		1971	YES	
Searchlight Guzz 6	28	64	22	SE		1971	YES	
Searchlight Guzz 7	28	64	8	SE		1971	YES	
Searchlight Guzz 8	27	64	21	SW		1970	YES	
Searchlight Guzz 9	27	64	21	SE		1971	YES	
Searchlight Guzz 10	28	64	6	SE		1971	YES	
Searchlight Guzz 11	28	64	15	NW		1971	YES	
Searchlight Guzz 12	28	64	31	NW		1971	YES	
Guzzler D-20	31	64	13	SW		1971	YES	
Guzzler D-21	32	64	1	SE		1971	YES	
Guzzler N-1	26	64	7	NE		1970	YES	
Guzzler N-2	26	64	19	NE		1970	YES	
Guzzler N-4	26	64	30	SE		1970	YES	
Guzzler N-5	26	63	24	NW		1970	YES	
Guzzler N-6	26	63	23	NW		1970	YES	
Guzzler N-8	25	64	31	NW		1970	YES	
Guzzler N-9	26	64	6	NE		1970	YES	
Guzzler N-10	26	64	5	NW		1970	YES	
Guzzler N-11	25	64	21	SE		1970	YES	
Guzzler N-13	25	64	32	NE		1970	YES	

TABLE .46-14 (addition)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	water Available At Source	Comments
	T (south)	R (east)	Sec.	$\frac{1}{4}$					

I RETEBA PEAKS

Guzzler D-11	31	65	30	SW	1971	YES		
Guzzler D-12	31	64	25	SE	1971	YES		
Guzzler D-13	31	65	18	SW	1971	YES		
Guzzler D-14	31	65	7	NW	1971	YES		
Guzzler D-15	30	65	32	NE	1971	YES		
Guzzler D-16	30	65	20	SW	1971	YES		
Guzzler D-17	30	65	18	SE	1971	YES		
Guzzler D-18	30	65	30	SW	1971	YES		
Guzzler D-19	30	65	31	SE	1971	YES		

TABLE 46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
JEAN LAKE ALLOTMENT									
Jean Lake Well	25	60	14	SE		5/21/79			Needs bird ladder, trough within corral unavailable to large mammals.
McCallahan Well #1	26	61	17	NE		5/21/79			Dry, needs to be redeveloped.
McCallahan Well #2	26	61	8	SW		5/21/79			On private land.
Smith Well	25	60	10	SE		5/21/79			Dry, abandoned.
Jean Reservoir	25	60	10	NW		5/21/79			Water present, located in the middle of Jean Lake.
Water Haul #2	26	60	28	NE		5/23/79			Needs bird ladder, trough within corral, unavailable to large mammals.
Roach Well	26	59	26	SW		5/23/79			Needs bird ladder.
Seep	28	61	18	NW		5/25/79			2 Dry, develop to provide yearlong water.
Scotts Well	28	61	7	NW		5/29/79			Needs bird ladder, fence protecting water source needs to be reconstructed to allow big game use.
Lucy Grey Spring	27	61	30	NW		5/29/79	Yes	No	Needs bird ladder in trough.
Water Haul #1	26	60	4	SW		5/23/79			Needs bird ladder.
Calada Well	27	60	22	NW		5/30/79			Needs bird ladder & drinker outside corral.
Roach Lake Reservoir	26	59	22	SW		5/23/79			60' radius, 4' deep, Water available to all wildlife.
Railroad Spring	26	61	31	NE	1 qt/min	5/30/79	Yes	Yes	Bird ladder needed in trough.
Willow Spring	27	61	18	NW	1 gal/min	6/7/79	Yes	Yes	Bird ladders needed in troughs.
Badger Seeps #2	26	61	31	SE	Trickle	6/7/79			Develop to provide yearlong water.

TABLE .46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
Seep	27	61	20	NW	1/2 gal/min		No	Yes	Develop to provide yearlong water.
Tubbs Seep	27	61	18	SE		6/7/79			Develop to provide yearlong water.
Roach Lake Reservoir #2	26	59	23	SW	Dry				
KYLE CANYON ALLOIMENT									
Cabin Springs #1	20	58	6	NW	1 pt/min	6/28/79	Yes	Yes	Drill and pipe to trough.
Cabin Springs #2	20	58	6	NW	1 pt/min	6/28/79	Yes	Yes	Drill and pipe to trough.
Harris Spring & Stream	20	57	11, 1,14, 15		30 gal/min	6/28/79	Yes	Yes	Harris Spring on private land.
D.J. Spring	20	58	18	SW	1 pt/min	9/29/79	Yes	Yes	
Unknown Seep	20	57	14	NE	1 pt/min	9/29/79	No	Yes	
Unknown Seeps	20	57	14	SE	2 gal/min	9/29/79	No	Yes	
LUCKY STRIKE ALLOIMENT									
Grapevine Spring	19	58	16	NW	1 qt/min	6/28/79	Yes	Yes	Needs bird ladder in trough.
Grassy Spring	18	58	32	SE	1 qt/min	8/2/79	No	Yes	Extensive trampling by wild burros. Fence & develop to provide water away from source.
Shoemaker Spring	18	58	33	SW	None	8/2/79	Yes	No	
Two Spring #1	18	57	22	NW	50 gal/min	7/25/79	No	Yes	
Two Spring #2	18	57	21	SW	Dry	8/2/79	No	No	2 Develop to provide yearlong water.

TABLE 46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
Sidehill Spring	19	57	21	NE	Dry	8/7/79			Develop catchment
Mud Springs	18	56	15	SE	Wet Meadow	8/7/79	Yes	Yes	Modify fences to allow large mammal access.
East Mud Spring	18	56	14	SE	1/2 pt/min	8/7/79	No	Yes	
McCULLOUGH MTN. ALLOTMENT									
Bullion Spring	28	60	20	SE	Undeterminable	4/27/79	Yes	Yes	Fenced and unavailable to large mammals. Wildlife drinker needed outside fence.
Thomas Spring	27	62	23	NW	1 pt/min	6/6/79	Yes	Yes	Develop to provide yearlong water, trough needs bird ladder.
Thomas Seep	27	62	23	NW		6/6/79			
Water Haul	28	63	32	NW		6/6/79			Needs bird ladder.
Rock Spring	26	61	22	NE	No flow	6/11/79	Yes	No	Repair leaking trough, needs bird ladder, develop source to provide yearlong water.
Deadhorse Spring	27	62	21	SE	Trickle	5/3/79		Yes	Provide catchment and shade to reduce evaporation.
Cow Spring	27	62	26	NE	Trickle	9/18/79	Yes	Yes	Develop to increase water yield and storage to insure yearlong water.
McCullough Spring	26	61	26	SW	1 qt/min	6/1/79	Yes	Yes	Trough needs bird ladder and float valve.
Highland Spring	27	62	16	SW	3 qts/min	5/4/79	Yes	Yes	
Ora Hanna Spring	27	62	5	SE		5/4/79	Yes		Install new pipeline.
Unknown Seep	27	61	33	NW	None	5/25/79	Yes	Yes	Redevelop to provide yearlong water.
Highland Guzzler	27	62	3	SW			Yes		
Highland Pockets (Highland Bighorn Water Tanks)	26	62	22	SW			Yes		

TABLE .46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location			Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments	
	T. (south)	R. (east)	Sec. 1/4						
Unnamed Stream	27	61	3, 4,10		Varies, intermittent	5/22/79	No	Yes	
Windmill Well	28	62	16 NW			6/1/79	Yes		Bird ladder needed.
Guzzler	26	62	34 NW			8/10/85			Appears to be functioning.
Reservoir	27	62	32 NW						Dry.
Cow Camp Trough & Tanks	27	62	35 SE						Dry, if water ever provided to trough, trough will need bird ladder.
Rock Spring Seep	26	62	34 NE	1/2 pt/min		9/18/79	No	Yes	Develop to provide water yearlong.
Unknown Seep	23	62	27 NE	Dry		8/8/79		Yes	Develop to allow large mammal use.
Lone Pine Spring	26	61	22 NW	Dry		8/8/79	Yes	No	
NEWBERRY MOUNTAIN ALLOTMENT									
Hiko Spring	32	65	12 SE	3 gal/min		4/19/79	Yes	Yes	Potential to develop as yearlong water source.
Pipe Spring	31	65	36 NE	Dry		4/19/79	Yes	No	Redevelop spring site.
Dripping Cave	31	65	36 S	3 gal/min		4/19/79	Yes	Yes	Develop to provide yearlong water.
Spring									
Christmas Well	31	65	9 SW	2 gal/min		4/25/79			Develop to provide yearlong water.
Rattlesnake Spring	31	65	16 NE	2 gal/min		4/25/79		Yes	Develop to provide yearlong water.
Fiapos Well	32	65	15 NE	Dry		4/25/79			Potential to develop as yearlong water.
Corral Spring	31	66	18 SW	10 gal/min		4/25/79	No	Yes	Develop a catchment to provide yearlong water.

TABLE 45-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
Discovery Spring	31	65	12	SW	0	9/18/79	No	Yes	
Willow Spring	31	65	14	NW	10 gal/min	4/25/79	Yes	Yes	Add storage tank & float valve to trough.
Grapevine Spring	31	65	15	NW	50 gal/min	4/19/79		Yes	
Bridge Canyon Spring	32	65	1	SE	10 gal/min	4/18/79		Yes	
Cottonwood Spring	31	65	28	SE	1/10 gal/min	9/18/79	No	Yes	Develop to insure yearlong
Laughlin 300 Guzzler	32	65	22	NE		6/13/85	Yes	Yes	✓ water. Heavy Livestock Use.
Davis Dam 1	32	65	16	NE		1971	Yes		
ROACH LAKE ALLOTMENT									
Water along U.P. Tracks	26	59	15,22,27,34			5/18/79			Surface runoff that collects near U.P. railroad tracks. Water appears alkaline.
SOUTH POINT ALLOTMENT									
Dry Riparian Area	33	66	16			4/18/79			Dry wash area with Mesquite, Salt Cedar that provides habitat for many non-game birds.
Well Site	33	66	9	SW		4/18/79			Dry, could possibly redevelop.
SPRING MOUNTAIN ALLOTMENT									
Cave Spring	24	58	6	SE		5/15/79	No	Yes	Available to all wildlife.
Spring near Cave Spring	24	58	6	SE	1 qt/min	5/15/79	Yes	Yes	Available to all wildlife.
Mexican Spring	23	58	30	SW	Trickle	7/11/79	No	Yes	✓ Develop to provide yearlong water.

TABLE .46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4						
Potosi Spring	23	57	12	NW	3 gal/min	7/11/79	Yes	Yes	Heavily impacted from human and wild horse use.
Bird Spring	24	59	4	NE	2 qts/min	7/12/79	Yes	No	Trough needs repair & bird ladder added.
Wilson Tank	23	58	24	SW	1 pt/min	8/10/78	Yes	Yes	Trough needs bird ladder.
Ninetynine Mine Spring	23	58	8	SE	1 gal/min	7/12/79	Yes	Yes	
Well Site	23	56	25	NW	Dry	7/9/79			
Wheeler Game Spring	22	59	12,7		24 gal/min	6/28/79	Yes	Yes	
Monmon Green Springs	22	58	12,1		5 gal/min	6/28/79	No	Yes	
Mud Springs #1	22	58	14	SW	3 pts/min	7/3/79	Yes	Yes	Trough needs bird ladder.
Mud Springs #2	22	58	15	SE	1.5 gal/min	7/3/79	No	Yes	Protect & develop as year-round water supply.
Lone Grapevine Spring	22	58	23	NW	10 gal/min	7/2/79	No	Yes	
Unknown Seep	22	58	22	NE	2 gal/min	7/2/79	No	Yes	
Bighorn Spring	22	58	29	NE	1 pt/min	7/6/79	Yes	Yes	Develop larger pool to collect water.
First Creek	21	58	33	NE	10 gal/min	7/3/79	No	Yes	
Oak Creek	21	58	21,22		15 gal/min	7/5/79	No	Yes	
Pine Creek	21	58	17,16		25 gal/min	7/5/79	Yes		
Ice Box Canyon	21	58	9,4		1.5 gal/min	7/5/79	No	Yes	
Brownstone Reservoir	20	58	25	NW		9/27/79			Water Present.
White Rock Spring	20	58	33	NE	1 gal/min	6/29/79	Yes		Needs bird ladder.
Bootleg Spring	22	58	7	SE	2 qts/min	7/10/79	Yes	Yes	Source located within a corral, provide water for wildlife & livestock outside corral.
Rainbow Spring	22	58	7	NE	Dry	7/9/79	Yes	No	Redevelop to provide yearlong water.

TABLE 46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec.	1/4					
Switchback Spring	21	57	12	NE	3 gal/min	8/3/79	Yes	Yes	
LaMadre Spring	20	58	29	NW	20 gal/min	7/17/79	Yes	Yes	
Mule Spring	22	57	15	SW	1.5 gal/min	8/24/78	Yes	Yes	Fence & develop source for wildlife, pipe excess water down canyon to provide water for livestock & burros.
Cane Spring	21	57	8,16		4 gal/min	8/3/79	Yes	Yes	
OC Spring	21	57	9	NW	10 gal/min	7/3/79	Yes		Needs bird ladder.
Sheep Spring	20	57	36	SW	5 gal/min	8/2/79	No	Yes	
Cave Spring	20	57	33	SW	1 gal/min	7/18/79	Yes	Yes	Protect Spring Source by fencing, pipe water to trough, provide bird ladders.
Claybank Spring	20	57	35	SW	1 gal/min	8/2/79	No	Yes	
Clay Basin Spring	20	57	35	NE	Dry	8/2/79			
Coal Spring	20	57	31	SE	10 gal/min	7/18/79	No	Yes	
Roses Spring	21	57	7	NE	1 gal/min	8/7/79			
Center Spring	20	57	28	NE	10 gal/min	7/7/79			
Narrow Spring	20	57	27	NW	30 gal/min	8/7/79		Yes	
Timber #1 Spring	20	57	29	NE	3 qts/min	9/29/79	No	Yes	
Timber #2 Spring	20	57	29	NE	1 gal/min	9/30/79	No	Yes	
Timber #3 Spring	20	57	20	SE	intermittent	8/2/79	No	Yes	
Lost Creek Spring	21	58	4	NW	15 gal/min	6/29/79	No	Yes	
South Fork Spring	20	57	36	SE	15 gal/min	7/17/79	No	Yes	
Red Spring	21	59	7,6		8 gal/min	6/29/79	Yes	Yes	Heavily used recreation site.
Lost Cabin Spring	21	56	36	NW	3 gal/min	8/24/78	Yes	Yes	Provide wildlife drinker at source.
Cave Spring #2	20	57	33	SE	1 gal/min	8/3/79	No	Yes	Development of catchment could increase water supply.
Unknown Seep #2	21	57	5	SE	2 gal/min	8/3/79	No	Yes	
Unknown Seep #3	21	57	26	SE	1 qt/min	8/3/79	No	Yes	Development of catchment could increase water supply.

TABLE 4-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location			Amount of	Date of	Evidence of	Water Available	Comments
	T.	R.	Sec. 1/4	Flow	Inspection	Development	At Source	
	(south)	(east)						
Willow Spring	20	58	33 SW	2 qts/min	6/29/79	Yes		Heavy recreation use. Intermittent pockets of standing water.
South Spring	21	57	25 SW	None	8/3/79			
Aztec Tank	23	58	21 SE	None	10/22/79			
Seep above Lost	21	57	19 NW	1/2 pt/min	9/28/79	No	Yes	
Cabin Spring								
Seeps South of	21	57	18 NE	3 qts/min	9/28/79	No	Yes	
Roses Spring								
Sandstone Seep #2	22	58	5 NE	1/2 pt/min	9/29/79	No	Yes	
#1 Seep N of	21	57	1 SE	1 pt/min	9/29/79	No	Yes	
Switchback								
Spring N of	20	57	36 NE	1 pt/min	9/29/79	No	Yes	
Switchback								
Claybank Spring #2	20	57	25 SW	6 gal/min	9/30/79	No	Yes	
Claybank Spring #3	20	57	26 NE	1/2 gal/min	9/30/79	No	Yes	
Timber #4 Spring	20	57	20 NW	1 gal/min	9/30/79	No	Yes	
S.W. Fork of Cave	20	57	33 SE	1 pt/min	9/28/79	No	Yes	
Spring								
#2 Seep N of	21	57	1 NE	2 qts/min	9/30/79	No	Yes	
Switchback								
Spring E of	21	58	8 NW	3 gal/min	9/29/79	No	Yes	
Switchback								
Unnamed Seep	21	57	8 SW	1 qt/min	9/28/79	No	Yes	
Rock Cliff Seep	19	56	7 NE	1 pt/min	9/28/79	No	Yes	Develop to make water more accessible.
Unnamed Seep	20	57	26 SW	1 1/2 gal/min	9/29/79	No	Yes	
Seep Spring	21	57	18 NW	1 gal/min	9/28/79	No	Yes	
Seep N of South	20	57	36 SE	1 pt/min	9/30/79	No	Yes	
Spring								
Unnamed Seep	21	57	5 NE	1 pt/min	9/29/79	No	Yes	Develop to provide yearlong water.
Upper Sandstone	21	57	5 SE	1 gal/min	9/29/79	No	Yes	
Seeps								
Upper Sandstone	22	58	9 NE		9/30/79	No	Yes	

TABLE .46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location			Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4					
Unnamed Seep in Red Rocks	22	58	16 NE	2 qts/min	9/30/79	No	Yes	
Red Rock Seeps	22	58	15 SW	1 pt/min	9/30/79	No	Yes	
Red Rock Seeps	22	58	22 NW	2 gal/min	9/30/79	No	Yes	
Trout Canyon Tributary Seeps	20	56	22, 23,14	1 to 20 gal/min	9/29/79	No	Yes	
STUMP SPRING ALLOIMENT								
Stump Spring	23	55	5 NW	Dry	7/7/79			
Unnamed Spring	22	54	15 SE	Dry	7/7/79			
Unnamed Spring	22	54	15 NW	None	7/10/79		Yes	6" puddle in the middle of a ravine.
Hidden Hills Spring	22	54	24 SE	Dry	7/7/79			
TABLE MOUNTAIN ALLOTMENT								
Goodsprings Well	24	58	26 NE	Dry	5/15/79			Redevelop.
UNALLOTTED AREA								
Cold Creek Ponds	17	56	31 SW	15 gal/min	9/11/79	Yes	Yes	
WHEELER WASH ALLOIMENT								
Wallace Spring	18	55	29 NW	2 qts/min	9/29/79	Yes		
Wheeler Well	18	55	20 SW	Dry	7/10/79			
Kiln Water Catch.	18	54	12 NE		6/19/84	Yes	Yes	

TABLE .46-14(continued)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location			Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T. (south)	R. (east)	Sec. 1/4					
Willow Creek	18	55	2 NE	125 gal/min	7/10/79	No	Yes	Heavy use by people camping & picnicking.
Buck Spring	18	55	35 SW	3 qts/min	8/7/79	Yes	Yes	Livestock trampling source.
Cold Creek Spring	18	55	1, 6,31	200 gal/min	7/18/79			Heavy recreational use area.
Wheeler Spring & Trough	18	55	20 NE	5 gal/min	7/7/79	Yes		
Artesian Well	21	54	3 NW	50 gal/min	7/7/79			Private land.
Unnamed Spring	21	54	3 SE		7/7/79	Yes		Private land.
Kiup Spring	20	56	31 SE	6 gal/min	5/18/79	No	Yes	
Trout Springs	20	56	10 SW	70 gal/min	7/12/79	Yes	Yes	
Trout Canyon Seep	20	56	16 SE	1 pt/min	9/28/79	No	Yes	
Peak Spring Canyon P.L.	20	56	6 SW	120 gal/min	9/29/79	Yes	Yes	
Wheeler Seep	19	54	12 NE	1 pt/min	9/29/79	No	Yes	
Spring N of Kiup	20	56	30 SE	2 qts/min	9/29/79	Yes	Yes	
YOUNTS SPRING ALLOTMENT								
Younts Spring	21	56	28 SE	Dry	7/16/79	Yes		2 Develop to provide yearlong Water.
Thorne Corral Trough	21	56	28 SW	Dry	7/16/79			

TABLE 46-14 (addition)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T (south)	R (east)	Sec	1/4					
SOUTH POINT									
Guzzler D-2	32	65	35	SE		1971	Yes		
Guzzler D-3	32	65	2	NE		1971	Yes		
Guzzler D-4	32	65	23	NE		1971	Yes		
Guzzler D-5	33	65	10	NW		1971	Yes		
Guzzler D-6	32	65	32	NE		1971	Yes		
Guzzler D-23	32	65	27	SE		1971	Yes		
McCULLOUGH MTNS									
Guzzler H-1	27	62	29	SE		1970	Yes		
Guzzler H-2	27	62	32	SW		1970	Yes		
Guzzler H-3	28	62	5	SE		1970	Yes		
Guzzler H-4	28	62	9	NE		1970	Yes		
Guzzler H-5	28	62	15	NE		1970	Yes		
Guzzler H-6	28	62	14	NE		1970	Yes		
Guzzler H-7	28	62	12	NE		1970	Yes		
Guzzler H-8	28	63	6	SE		1970	Yes		
Guzzler H-9	28	62	12	NE		1970	Yes		
Guzzler H-10	28	62	13	NE		1970	Yes		
Guzzler H-11	28	63	19	NW		1970	Yes		
Guzzler H-12	28	63	21	NW		1970	Yes		
Guzzler H-13	28	63	16	NE		1970	Yes		
Guzzler H-14	28	63	9	NE		1970	Yes		
Guzzler H-15	28	63	4	NW		1970	Yes		

TABLE .46-14 (addition)
Stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment

T Location
(south) (east) Sec.

1/4

Amount of
Flow

Date of
Inspection

Evidence of
Development

Water Available
At Source

Comments

UNALLOTTED

Red Rock Guzzler 3 19 59 32 NW

9/24/85

Yes

Yes

Drinker may be
cracked + draining tanks

NEWBERRY MTNS

Guzzler D-22 32 65 10 NW

1971

Yes

Guzzler D-10 32 65 5 NW

1971

Yes

Guzzler D-9 32 65 8 SW

1971

Yes

Guzzler D-8 32 65 18 SW

1971

Yes

Guzzler D-7 32 65 30 NE

1971

Yes

CHRISTMAS TREE PASS

Guzzler D-21 32 64 1 SE

1971

Yes

Guzzler D-20 31 64 13 SW

1971

Yes

TABLE 46-14 (addition)
stateline Planning Unit

WILDLIFE WATER INVENTORY SUMMARY

Allotment	Location				Amount of Flow	Date of Inspection	Evidence of Development	Water Available At Source	Comments
	T (south)	R (east)	Sec.	1/4					

CRESCENT PEAK

Guzzler CP-1	29	62	36	SW	1970	YES		
Guzzler CP-2	30	62	2	SE	1970	YES		
Guzzler CP-3	30	62	7	SW	1970	YES		
Guzzler CP-4	30	62	11	SW	1970	YES		
Guzzler CP-5	30	62	2	NW	1970	YES		
Guzzler CP-6	30	62	3	NW	1970	YES		
Guzzler CP-7	30	62	4	SW	1970	YES		
Guzzler CP-8	29	62	32	SE	1970	YES		
Guzzler CP-9	29	62	32	NE	1970	YES		
Guzzler CP-10	29	62	34	NE	1970	YES		
Guzzler CP-11	29	62	27	NE	1970	YES		
Guzzler CP-12	29	62	28	NW	1970	YES		
Guzzler CP-13	29	62	28	SE	1971	YES		
Guzzler CP-14	29	62	26	SE	1971	YES		
Guzzler CP-15	30	63	6	SW	1971	YES		

TABLE .46-15

Clark County

MULE DEER HARVEST

NDW Management Area	1975	1976	1977	1978	1979
26*	10	5	2	3	7
27**	13	12	11	17	31

In 1975 the hunt was 16 days, 1976 was 23 days, all other years were 30 days.
All hunts were buck only.

* Includes the Spring Mountains.

** Includes the Virgin Mountains, Newberry Mountains, McCullough Range, and Gold Butte Area.

Source: NDW 1976-1980 Mule Deer Investigations and Hunting Season
Recommendations.

TABLE .46-16

Clark County

ELK HABITAT BY GRAZING ALLOTMENT

SPRING MOUNTAIN RANGE

Grazing Allotment	Acres of Elk Habitat in Allotment	Percent of Habitat Located in Allotment	Present Total Perennial Elk Forage Capacity (AUMs)
Kyle Canyon	10,345	6	0
Lucky Strike	36,614	21	621
Spring Mountain (Unallotted)	13,428	8	409
Unallotted (3333)	10,304	6	756
Wheeler Slope (Unallotted)	20,955	12	287
Wheeler Wash	81,615	47	947
TOTAL	173,261	100	3,020

TABLE .46-17

Clark County

MOUNTAIN LION OCCURRENCE OUTSIDE THE SPRING MOUNTAIN RANGE

Date	Mountain Range	Location	Age	Sex	Record Type
11/24/71	Sunrise Mountain	T20SR62E Sec.23	-	-	Sighting (2)
03/--/72	Las Vegas Valley	T21SR63E Sec.22	-	-	Tracks only
08/27/75	Las Vegas Valley	Residential Area	Adult	-	Captured (1)
07/07/78	Eldorado Range	T26SR64E Sec.33	Young	-	Sighting (1)
09/10/78	Eldorado Range	T26SR63E Sec.3	Adult	-	Sighting (1)
10/04/77	McCullough Range	T24SR62E Sec.30	Adult	-	Sighting (1)
06/21/78	McCullough Range	T22SR62E Sec.9	Adult	-	Sighting (1)

Source: NDW February 1980

TABLE .46-18
Clark County

RABBIT HARVEST

<u>Year</u>	<u>1979</u>	<u>1978</u>	<u>1977</u>	<u>1976</u>	<u>1975</u>
No. Harvested	61,764	47,763	19,010	22,518	27,168
% of Nevada					
Statewide Harvest	45	31	26	42	46

Source: NDW 1976-1980, Upland Game Investigations and Hunting
Season Recommendations

TABLE .46-19
Clark County

FUR HARVEST 1975-1980

<u>Animal</u>	<u>Season</u>				
	1975-76	1976-77	1977-78	1978-79	1979-80
Badger	0	1	0	69	62
Bobcat	44	15	3	526	534
Coyote	9	28	11	527	863
Gray Fox	0	16	0	215	397
Kit Fox	0	0	0	242	570
Mink	9	16	6	0	0
Muskrat*	139	150	72	200	49
Raccoon	0	18	0	0	0
Ring-tailed Cat	0	0	0	5	15
Spotted Skunk	1	0	0	5	7
Striped Skunk	0	32	0	12	12

* Harvest probably did not occur on public land

Source: NDW 1976-1980, Fur Investigations

TABLE .46-20
Clark County

FUR HARVEST VALUES

<u>Species</u>	<u>Average Price</u>	<u>Average Price</u>
	<u>1979-80</u>	<u>1978-79</u>
Badger	\$ 11.08	\$ 22.29
Bobcat	181.80	314.57
Coyote	35.48	55.10
Gray Fox	41.26	45.11
Kit Fox	12.71	12.61
Muskrat *	5.08	3.91
Ring-tailed Cat	6.83	6.50
Spotted Skunk	4.18	6.22
Striped Skunk	2.50	2.79

* Data included only for those animals harvested in Clark County.

** Harvest probably did not occur on public land.

Source: NDW 1980 Fur Investigations.

B. Terrestrial Species - Birds

Overlays

Three overlays have been prepared for each planning unit.

Waterfowl and Aquatic Species Habitat - showing habitat for waterfowl, fishes, and molluscs.

Nongame Birds Habitat - showing important habitat for nongame birds, such as nesting habitat.

Gambel's Quail and Chukar Partridge Distribution - shows habitat for quail and chukar, and summer crucial areas for quail. The Virgin Valley Planning Unit Overlay shows information for Gambel's quail only, there are no chukar in the planning unit.

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Narrative

a. GAMBEL'S QUAIL (Lophortyx gambelii)

Population History

Gambel's quail are native to southern Nevada and are distributed throughout Clark County (see the Gambel's Quail and Chukar Partridge Distribution Overlay). Clark County encompasses 3,240,315 acres of quail habitat. Distribution may be limited in some areas, particularly during the summer months,

due to a lack of available water. Attempts to increase distribution by providing water catchments have been intermittently continued since the 1940s by the Nevada Department of Wildlife.

Estimates of population are extremely variable from year to year dependent largely on climatic conditions, primarily precipitation. In dry years, numbers may be as low as a few thousand birds, whereas under optimum conditions, several hundred thousand birds may be produced. Production estimates from sampling done for the years 1975-1980 are presented in Table .46-21.

Breeding season begins in early April and ends about the first of May. Quail compete vigorously for mates. After pairing is complete and the breeding territory has been defined, the cock defends it against intruders.

Gambel's quail nest on the ground beside or beneath desert scrub vegetation or grass clumps where concealment is good (Edminster 1954). The average clutch size is 12 with an incubation period of 21 to 23 days. Eggs are a dull buffy or whitish color and are heavily marked with irregularly shaped reddish-brown blotches. Incubation is primarily the responsibility of the hen although the cock will share the responsibility. The cock spends most of his time defending the nest from intruders. The hen usually leaves the nest for feeding and resting twice a day, early morning and early evening. Re-nesting usually occurs after a nest loss.

Hatching usually occurs in May or early June with re-nests hatching as late as July or August. Chicks are capable of leaving the nest as soon as they are dried off and weather permits. Both parents share the responsibility for the brood. Flying begins at about two weeks, plumage is well developed in about four weeks, and juvenile plumage is completed in eight weeks.

In the fall (September, October) family coveys join with each other to form large coveys. These coveys usually reach maximum size in late fall and early winter, and may range from 12 to 100 birds. Large coveys are usually associated with watering areas during drought conditions when succulent vegetation is nonexistent.

Daily movements depend on the availability of water or succulent vegetation and on food supply. At sunrise the birds leave the roost and water, if water is nearby; otherwise they begin feeding. Weather permitting they may spend as much as three

hours foraging. The middle of the day is spent resting or dusting beneath the shade of a woody plant. Evening feeding begins about an hour before dusk with roosting beginning shortly thereafter.

Seasonal Use Areas

Gambel's quail are distributed throughout Clark County. See the Gambel's Quail and Chukar Partridge Distribution Overlay for habitat areas. During the hot summer months, areas around waters become crucial habitat.

Food

Gambel's quail are primarily vegetarians. Animal matter (insects) comprises only 1 to 7 percent of the total annual food consumption of quail, though it could be as high as 20 percent for short periods in early summer and early fall (Edminster 1954). Animal protein is important in the development of egg protein and is necessary for the proper growth of young birds in the first few months of life (Gorsuch 1934).

Vegetative foods utilized by quail are primarily in the form of seeds although vegetative parts are consumed in winter and spring, and fruits are consumed in summer and fall as they ripen. Legumes comprise the most important group of plants utilized by quail. Seeds of deervetch (Lotus spp.), milkvetch (Astragalus diversifolius), lupine (Lupinus spp.), and bur clover (Trifolium spp.) are consumed in summer and fall. The vegetative parts of these same legumes are utilized in winter and spring.

The second most important group is weeds. Seeds of the following weeds are utilized in the season indicated:

tansymustard (Descurainia menziesi) - spring
Watson spiderling (Boerhaavia watsoni) - summer
euphorbia (Euphorbia spp.) - summer, fall
pigweed (Amaranthus spp.) - summer, fall
Russian thistle (Salsola spp.) - summer, fall
Rock daisy (Laphamia spp.) - summer, fall
Pepperweed (Lepidium spp.) - summer, fall
Chickweed (Cerastium spp.) - summer, fall
Wild sunflower (Helianthus spp.) - summer, fall
Bassia (Bassia spp.) - fall, winter

Both the vegetative portion and seeds of grasses are utilized by Gambel's quail. Tender shoots of many grasses are eaten as they appear in winter and spring; their seeds are utilized in the summer. Woody plants furnish food in the form of fruits, seeds of fruits, and dry seeds. Examples include cholla (Opuntia spp.), prickly pear (Opuntia spp.), barrel cacti (Ferocactus spp.), mesquite (Prosopis spp.), mistletoe (Phoradendron spp.), lotebush (Condalia lycoides), and wolfberry (Lycium spp.).

Grit requirements are considered high for Gambel's quail. Gorsuch (1934) found that grit composed 10 to 30 percent of total stomach contents and was highest in February, March, and August.

Water

Gambel's quail have become highly adapted for survival in a desert environment. Free water is not necessary to meet physiological water requirements. Water can be indirectly obtained from succulent plants. However, when drought conditions exist and succulent plants are nonexistent, free water must be available within four miles of cover (Edminster 1954). The Nevada Department of Wildlife believes that 1.5 miles is more realistic (Cooper, NDW, personal communication, 1980).

Cover

Important cover types provide nesting, feeding, roosting, and dusting sites. Leopold (1933) describes optimum quail habitat as an area where these different cover (vegetation) types are interspersed throughout the area with a high frequency of juxtapositioning. Stands of unbroken creosote make the poorest habitat; however, quail are often found where these unbroken stands of creosote are dissected by numerous washes. These washes usually support a higher diversity of flora (i.e., desert willow, desert peach, wolfberry) than the adjacent area. This diversity provides the variety of vegetation types that is most beneficial to quail in providing nesting, feeding, roosting, and dusting sites.

In Nevada, good quail habitat can be described as an alluvial fan between 2,000 and 4,500 feet, dissected by numerous washes. The vegetation adjacent to these washes is interspersed with Ambrosia dumosa (formerly Franseria dumosa), Larrea divaricata, Coleogyne ramosissima, Ephedra nevadensis, Yucca brevifolia (Joshua tree), and Yucca schidigera. The vegetation in these washes includes Chilopsis linearis (desert willow), Prunus fasciculata, and Acacia greggii (catclaw).

Important Use Areas

All springs, seeps, impoundments, or other water developments located in quail habitat are important use areas for the birds. These areas are crucial to survival in the summer. Distribution of quail will correspond to the availability and distribution of waters. In Clark County there are 884,630 acres of crucial summer habitat and 35,063 acres of potential crucial summer habitat (see the Gambel's Quail and Chukar Partridge Distribution Overlay). Tables .46-22 and .46-23 show the acreage of crucial

and potential crucial summer habitat in each planning unit by allotment.

Special Use Areas

No special use areas have been identified for quail in Clark County.

Conflicts

No serious competition appears to exist between quail and other upland game species although they utilize many of the same water sources and may cohabit the same general areas. Conflicts with livestock, horses, and burros may occur around specific waters, especially where heavy use by ungulates has removed desirable vegetation (food and/or cover) nearby. In some instances this conflict could be mitigated by protecting the water sources.

Water developments which do not include adaptations designed for bird use can be hazardous and can cause drowning should the bird fall in. Installation of bird ladders and/or flotation devices can prevent this type of accident.

The noise, soil disturbance, and vegetation removal created by off-road vehicle use are conflicts which may be encountered throughout quail habitat. Seemingly of particular interest to not only off-road vehicle users, but also to hunters, hikers, and other recreationists, are the guzzlers interspersed throughout the county. Human activity in these sites disturbs the birds and the potential of vandalism to the guzzlers is high.

Harvest

Hunter success figures and harvest data for 1974-1979 in Clark County are presented in Table .46-24. Season and bag limits are prescribed annually by the Nevada Department of Wildlife in accordance with forecast abundance. Long seasons and large bag limits correspond with years of high productivity, while the opposite holds true in years of poor production.

Nonconsumptive Use

None identified for this species.

Habitat Loss or Change

Any habitat loss or change foreseen would be primarily caused by one or more of three activities: man's continuing encroachment on hitherto unclaimed areas; continued trampling or overuse by livestock, wild horses, or burros; and off-road vehicle use in

areas not used before. These factors could be controlled by management should the need arise in specific cases.

*** Opportunities

Through the HMP process, guzzlers or other water developments could expand existing quail summer habitat.

b. MOURNING AND WHITE-WINGED DOVES

Population History

Populations consist of mourning dove (Zenaidura macroura) and small numbers of white-winged dove (Zenaida asiatica). High densities of dove are found in agricultural areas such as the Moapa and Virgin River Valleys.

Seasonal Use Areas

These birds are widespread during the seasonal use periods. Dove are present in the county mainly from April to September. Low populations of birds may be found in March, October, and November.

Only generalizations about critical use areas can be made. Any riparian habitat affording cover (such as tamarisk) and food, with water nearby should be considered critical habitat. Watering areas are critical in the upland areas.

Availability of free water is an important limiting factor for doves. Unlike quail, doves must drink water throughout the year to survive. Sometimes they drink 3 to 4 times a day (in mornings and evenings) and will travel 4 to 12 miles to get a drink (Gubanich 1966).

Many man-made water sources such as guzzlers and livestock watering troughs and open storage tanks are very important to dove (see the Water Inventory Overlay in URA 2). Undeveloped springs, seeps, and potholes which collect rainwater are used by doves.

Important Use Areas

No specific important use areas have been identified.

Special Use Areas

No specific special use areas have been identified.

Conflicts

No specific conflicts have been identified.

Harvest

Table .46-25 shows the dove harvest statistics for the past five years in Clark County.

Nonconsumptive Use

No specific nonconsumptive use has been identified. Dove are a common sighting for birdwatchers.

Habitat Loss or Change

The greatest habitat loss occurs when dove are unable to utilize open water troughs and storage tanks.

*** Opportunity

To allow doves to drink, all water troughs and open storage tanks should be equipped with bird ladders like those described in BLM Technical Note-305, September 1977.

c. WATERFOWL

Although many species of waterfowl are found throughout the wetland areas of Clark County, there is virtually no use by these species on the arid lands administered by the BLM. Almost all of the waterfowl habitat within the county is associated with private property, on state owned management areas, or on lands administered by other federal agencies such as the National Park Service. Improvement of waterfowl habitat within the county is also limited because of the lack of suitable habitat (NDW February 1980).

Some springs not administered by BLM have been impounded to form ponds: Indian Springs, Corn Creek (Desert Game Range), Tule Springs and Lorenzi Park. Also a series of sewage settling ponds provide some waterfowl habitat northwest of Henderson. Several species (American coot and ruddy duck, for example) feed at these locations but do not breed (Austin and Bradley 1971).

In 1968, the District Wildlife Specialist identified BLM land along the Virgin River as valuable waterfowl and upland game habitat. The main value of the area for waterfowl was resting habitat, as little food or cover plants are present. A recommendation was made that the lands be classified for

retention for multiple use (Myers 1968). The subject lands were designated as the Virgin River Recreation Lands pursuant to the Classification and Multiple Use Act. The details of the classification are in case file N-1575-A. The designation was made for the protection of habitat of interesting, rare, and unusual plants and animals. Approximately 4,930 acres were designated (see the Waterfowl and Aquatic Species Habitat Overlay).

*** Opportunity

The Virgin River Recreation Lands should be inventoried and evaluated in a Habitat Management Plan proposed for the Virgin River.

d. CHUKAR PARTRIDGE (Alectoris graeca)

Population and Life History

Chukar partridge were first introduced into Nevada during the 1930s in an effort to provide an alternate game bird in the state. Between 1939 to 1960, 1,453 birds were released in Clark County in a variety of habitat types. Although the introduction of the chukar throughout most of Nevada is considered a success, attempts to establish populations in the southern portion of the state have been relatively disappointing. The apparent cause for the poor survival in this area is suspected to be due to the combination of high temperatures and erratic precipitation, resulting in extremely dry conditions much of the year. Small resident populations of chukar persist in the northern end of the Spring Mountain Range, and Hart Mountain near the California state line. Occasional observations are reported around a few select springs in the Virgin, Highland, McCullough, Pintwater, and Las Vegas Mountain Ranges (NDW February 1980). Those areas where the chukar partridge observations have shown to be more frequent over the years are shown on the Overlay.

Pairing of mates begins in late February or early March while the birds are still in the covey. Dispersal of the pairs and territory definition occurs in March or early April with mating usually beginning in late March (Edminster 1954). A clutch of 14 to 16 eggs (average) is generally completed by early May followed by 24 days of incubation by the hen (Christensen 1970). The cock often deserts the hen prior to hatching or shortly thereafter and joins other cocks in small groups. Chicks are able to leave the nest almost immediately after hatching, and are capable of short flights by the time they are two weeks old. The chicks are essentially full grown at 12 to 16 weeks of age and may join with other families in late summer forming large coveys.

Food

Diet studies for chukar have been conducted in several states, including portions of Nevada. No information has been recorded, however, with respect to chukar diet in Clark County. Since most plant species identified in crops of harvested birds from central and west central Nevada are found in Clark County, basic similarities in the respective diets are expected.

Grass seeds and leaves, especially cheatgrass (Bromus tectorum), annuals, grains, fruits, and animal matter are important constituents of chukar diet. Utilization of cheatgrass seeds and/or leaves is important yearlong, even in years when an abundance of other plants is available (Christensen 1970). Seeds and/or leaves from cheatgrass comprise over 50% of winter diet, 23% of spring diet, 16% of summer diet, and 29% of fall diet (Edminster 1954). In the late fall and winter months, grass blades comprise the bulk of the diet, along with filaree (Erodium cicutarium) seeds and vegetative parts of germinating plants. With the coming of spring, chukar turn to the vegetative parts of fiddleneck (Amsinckia tessellata), lesser gilia (Gilia inconspicua), wild onion (Allium spp.), and various green grass blades. Grasshoppers, caterpillars, ants, and other insect-like animals are consumed in the spring through fall months providing the necessary protein to the diet of young birds. Seeds are utilized heavily in the summer, primarily cheatgrass, filaree, fiddleneck, and to a lesser extent, ricegrass (Oryzopsis hymenoides), dock (Rumex spp.), and mustard (Descurainia spp.).

Overgrazing of the range may, in fact, enhance the range with respect to chukar habitat (Edminster 1954). Excessive forage utilization by domestic livestock and wild horses and burros encourages the growth of many chukar key foods, most notably cheatgrass. The poor condition of much of the range in Clark County (see Tables .44-2 and .44-3 in Section .44, Range Management), therefore, would seem to favor chukar food habits.

Water

Although chukar prefer to inhabit arid climates, the availability of free water during the hot summer months is a necessity. The water may be obtained from streams, springs, seeps, impoundments, and other watering facilities. Summer distribution of the birds depends largely on the availability and distribution of waters in their habitat. As a rule, chukar will remain within a mile radius of a water source during the summer.

Cover

Chukar appear to be adapted to life at a variety of altitudes at heights of 1,000 to 8,000 feet (Edminster 1954). They do well in arid ranges so long as there is access to free water in the summer when succulent vegetation may be lacking. Steep talus slopes, rock outcrops, and rugged canyons with scattered vegetation are preferred cover for roosting and escape. Chukar use the rugged terrain to their unique advantage preferring, when disturbed, to run uphill to elude any pursuers. Their shallow nests are usually hollowed out on steep open slopes with only scattered grass or shrubs for cover. In the summertime, they may frequent canyon floors, creek bottoms, and farm edges, however, in the winter they prefer to live on rough slopes and ranges. Bunchgrasses, cheatgrass, and sagebrush are the plants most often encountered in chukar habitat. All the necessary habitat components (with the possible exception of free water) - aridity, rugged terrain, and cheatgrass/sagebrush communities - are well represented in this area, providing ample cover and opportunity for establishment.

Important Use Areas

All springs, seeps, impoundments, or other water developments located in chukar habitat are important use areas for the birds. These areas are crucial to survival in the summer. Distribution of chukar will correspond to the availability and distribution of waters. In Clark County there is a total of 4,469 acres of important crucial summer habitat (see the Gambel's Quail and Chukar Partridge Distribution Overlay). Table .46-26 shows the acreage of crucial summer habitat by allotments.

Special Use Areas

No special use areas have been identified for chukar in Clark County.

Conflicts

No serious competition appears to exist between chukar and other upland game species although they utilize many of the same water sources and may cohabit the same general areas. Conflicts with livestock, horses, and burros may occur around specific waters, especially where heavy use by ungulates has removed desirable vegetation nearby. In some instances this conflict could be mitigated by protecting the water sources.

Water developments which do not include adaptations designed for bird use can be hazardous and can cause drowning should the bird fall in. Installation of bird ladders and/or flotation devices can prevent this type of accident.

The noise, soil disturbance, and vegetation removal created by ORV use are conflicts which may be encountered throughout chukar range. Seemingly of particular interest to not only ORV users, but also to hunters, hikers, and recreationists, are the guzzlers interspersed throughout the county. Human activity in these sites disturbs the birds and the potential of vandalism to the guzzlers is high.

Harvest

Data for hunter success in Clark County for 1975, 1977, 1978, and 1979 are presented in Table .46-27. The percent of upland game hunters objectively hunting chukar has steadily risen over the years until, in 1979, 95 percent of the hunters sampled were actively seeking chukar. This figure obviously indicates the importance the chukar has attained as an upland game bird in this area. The average hunter success in 1979 was slightly over five birds per hunter.

Nonconsumptive Use

None identified for this species.

Habitat Loss or Change

Past habitat loss or change is unknown at this time. Man's encroachment on hitherto unclaimed areas; the trampling or overuse of riparian areas by livestock, wild horses, or burros; and expansion of areas used by ORVs, are three primary potential influences that could cause habitat loss or change for chukar. These factors could be controlled by management should the need arise in specific cases.

*** Opportunities

Habitat expansion for chukar may be possible by providing yearlong water in suitable habitat.

e. PHEASANTS (Phasianus colchicus)

Population History

The ring-necked and white-winged subspecies of pheasants were introduced into the agricultural areas of Clark County as part of an exotic game bird release program by the Nevada Department of Wildlife between the mid-1950s and 1969. "All of the releases and most of the use has been confined to the State Wildlife Management Area at Overton and private property holdings in the Virgin, Moapa, and Pahrump Valleys. Very little if any of the

current pheasant use occurs on lands administered by the BLM" (NDW February 1980).

"Although no pheasants have been released since 1969, the agricultural areas continue to support small resident populations of ring-necked and white-winged pheasants as well as hybrid crosses of the two subspecies. Limited numbers of birds are present in all of the valley areas where they were originally released" (NDW February 1980).

Harvest

Table .46-28 indicates the harvest of pheasants in Clark County for the past five years. Almost all of the harvest probably occurs on private land or on the Overton Wildlife Management Area.

*** Opportunities

The opportunity to improve habitat for pheasants on BLM administered land in Clark County is negligible.

"The habitat for pheasants in Clark County is marginal at best because of the limited amount of agricultural area available to the species in addition to poor food resources in terms of grain production. Most of the irrigated croplands in the county are associated with the production of alfalfa and/or pasturelands that are not conducive to high quality pheasant habitat. Also, the current practices of clean fencerows and ditch banks eliminates important escape cover" (NDW February 1980).

"It is doubtful that the current populations of pheasant in Clark County will be expanded in the future because of the limited habitat available to the species. Low density populations should persist into the future in the agricultural areas of the Virgin, Moapa and Pahrump Valleys although increases in population levels are not anticipated" (NDW February 1980).

f. WILD TURKEYS (Meleagris gallopavo)

Population History

"Wild turkeys are not native to Nevada but do occur in limited numbers on the Spring Mountain Range as a result of the exotic game bird release program initiated by the Nevada Department of Wildlife. A total of 24 turkeys were wild-trapped in Arizona and released near Camp Bonanza on the Spring Range during February of 1960. An additional 20 turkeys also from Arizona were released in the same general area during March of 1962. These two

releases provide the basis for the small population of turkeys that inhabit the range through the present day.

"Follow-up efforts showed that the non-native birds were able to adapt to the marginal habitat as evidenced by successful reproduction. Observations of the birds were reported commonly through the 1960s in the vicinity of the release site in addition to Wallace and Clark Canyons. The outside limits of distribution since the releases in the early 1960s appear to encompass most of the range between Kyle Canyon on the south and Wheeler Pass on the north with most observations still reported in the vicinity of the release site.

"Random observations from recent years indicate that a remnant population of wild turkeys continues to exist on the Spring Range with sightings noted near the release site and adjacent canyons. It is suspected, however, that the population is small and will continue to be limited because of the lack of suitable habitat. The estimated population at the present time ranges between 50 and 100 birds depending on the annual reproductive success" (NDW February 1980).

Harvest

"An experimental season was established for the Spring Mountain turkey population during 1965 for the primary purpose of collecting biological data on the species. A total of 50 tags were awarded by drawing for the hunt that ran from October 9 through November 14. The hunters reported observing 81 total birds (includes probable duplications) while harvesting only two tom turkeys. The season has not been reopened since 1965" (NDW February 1980).

*** Opportunities

"The Spring Mountain Range offers only marginal and very limited habitat for wild turkeys and it is therefore suspected that the introduced population will always be present in only low density numbers. It is also improbable that habitat improvements would significantly increase the numbers of birds since the native vegetation of Nevada is not considered as high quality habitat for the species." (NDW February 1980).

g. OTHER INTRODUCED GAME BIRDS

Population History

Crested tinamou (Eudromia elegans), scaled quail (Callipepla squamata), common sand grouse, grey francolin, and black

francolin were all introduced into Clark County by the Nevada Department of Wildlife to try to establish other game species for southern Nevada hunters. None of the species were successfully established.

h. NONGAME BIRDS

Population History

No data is available to describe the population history of nongame birds in Clark County.

Seasonal Use Areas

Table .46-29 shows the general raptor distribution and relative abundance in Clark County.

All raptors (hawks, falcons, owls, and vultures) are protected by state and federal law. The peregrine falcon (federally listed as endangered) has been sighted in the Spring, Virgin, and Newberry Mountains. The prairie falcon is more common and widespread, and can be found throughout the county. The bald eagle (federally listed as endangered) is known to winter at Lake Mead.

"Caves, cliffs, rock escarpments and rims provide nesting, perching, and roosting sites required by raptors, especially the falcons, buteos, eagles and owls (NDW February 1980).

"Stream and spring riparian habitat including mesquite-bosque and aspen-cottonwood, provide the required nesting and foraging habitat for accipiters, buteos, owls, passerine and other nongame wildlife species. This habitat provides the basic prerequisites of food, water, and cover not found in adjacent areas. Thus, a large percentage of wildlife species occurring in a given area are directly dependent on, or utilize this habitat type proportionately more than any other. Wetlands provide the required habitat needed by bald eagles, osprey, water and shorebirds and numerous other nongame species" (NDW February 1980).

Important Use Areas

Water associated habitats are the most critical for nongame birds in Clark County.

"Meadow Valley Wash extending from Caliente to Glendale has been documented as particularly important key habitat for nongame species. The riparian habitat provides especially important nesting and feeding habitat for Cooper's hawks, American

kestrels, and other raptorial species. High densities of avian, reptilian, amphibian and mammalian species have also been found associated with and dependent on this habitat. Cliff habitat bordering Meadow Valley Wash is important nesting habitat for golden eagles and prairie falcons" (NDW February 1980).

"Two portions of Lake Mead, the Overton Arm and Temple Bar to Iceberg Canyon, have been identified as critical wintering areas for the endangered bald eagle. Prey and perching sites for bald eagles and migratory habitat for other nongame wildlife including the white pelican, long-billed curlew, and the osprey are provided by Overton Wildlife Management Area and the portion of the Virgin River south of Mesquite, Nevada" (NDW February 1980).

Bird surveys (1976-1978) by the BLM Desert Plan Program, Riverside, California (unpublished) in Piute Valley, California (southern portion of the valley which originates in Clark County, Nevada) indicate that desert washes in creosote-burrobush communities are utilized to a greater extent than the surrounding creosote-burrobush. Data shows that winter bird densities are 50 to 60 times higher and that spring (breeding) bird densities are 12 times higher in these washes.

Las Vegas Wash is considered important nongame bird habitat, with 257 species of avian fauna noted nesting or feeding there (U.S. Fish & Wildlife Service September 1980). However, BLM has no jurisdiction over Las Vegas Wash. All of the Wash is either private or withdrawn and under the jurisdiction of the Water and Power Resources Service.

Important habitats for nongame birds and raptors are identified on the Nongame Birds Habitat Overlay.

Special Use Areas

No areas in Clark County have been withdrawn or designated as special use areas for nongame birds or raptors. However the Virgin River Recreation Lands were designated for the protection of habitat of interesting, rare and unusual plants and animals. These lands provide habitat for many nongame birds including shorebirds. The Virgin River Recreation Lands include almost all the parcels of BLM administered lands along the Virgin River in Nevada

Conflicts

Conflicts between nongame birds and other resource uses in Clark County are varied. ORV use (including seismic activity) in desert washes may be particularly detrimental because nongame

birds are concentrated in these areas as indicated previously. Conflicts from other recreation users may also be detrimental. Rock climbing, hiking, backpacking, and camping have been observed to cause abandonment and/or disruption of nesting raptors (Call 1979). These types of activities may be affecting raptors in the Red Rock Canyon Recreation Lands. As the population of Las Vegas grows, the popularity of Red Rocks will increase as will the potential conflicts to raptors and other nongame birds.

Livestock water developments throughout Clark County do not have bird ladders to allow wildlife access. The wildlife habitat inventory completed in 1979 indicates which developments need bird ladders. Tables .46-13 and .46-14 summarize the information gathered during the Wildlife Habitat Inventory.

Harvest

Not applicable.

Nonconsumptive Use

Nevada Department of Wildlife personnel estimate two or three raptors have been captured legally each year in Clark County by falconers.

Habitat Loss or Change

Wetland habitat in Las Vegas Wash is being lost as a result of a stream head-cut from increased water flow through the wash (USDI 1980). BLM however does not administer any land along the wash and nothing can be done by this agency to correct the situation.

Other habitat losses are occurring on BLM administered lands. ORV use in desert washes, particularly washes with mesquite, desert willow, or other pseudo-riparian plant species, is impacting habitat important to nongame birds. Loss of riparian habitat around springs from development of the springs or from livestock or wild horse or burro trampling and grazing has occurred at several springs in Clark County. The specific problems at individual springs are identified in the Wildlife Habitat Inventory conducted in 1979.

*** Opportunities

Potential exists for improving habitat for nongame birds in the Virgin River Recreation Lands. A Habitat Management Plan for this area should be completed. Plant diversity along the river is limited. Planting of cottonwoods and true willows would be beneficial. Measures to manipulate the flow and impound water may be possible unless legal restraints prevent such actions.

Bird ladders should be constructed in all livestock water developments where lacking.

Spring sources and other riparian areas could be protected from trampling or overgrazing by livestock and wild horses.

Coordination with BLM ORV and Mineral specialists could be accomplished to limit ORV use by seismic crews and organized ORV users in important washes used by nongame birds especially during the spring and winter periods.

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TABLE .46-21
Clark County

GAMBEL'S QUAIL PRODUCTION

Year	Total Birds Counted	Adult	Young	Adult/Young Ratio	Average Brood Size
1980	2,235	531	1,654	100/311	9.1
1979	5,475	899	4,588	100/510	11.1
1978	3,346	581	2,765	100/476	11.4
1977	3,462	987	2,522	100/256	7.8
1976	3,602	606	2,996	100/494	10.7

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TABLE .46-22
Virgin Valley Planning Unit

GAMBEL'S QUAIL HABITAT BY ALLOTMENT

Allotment	Acres in Allotment	Acres Quail Habitat	Percent of Allotment	Acres Crucial* ^a Summer Quail Habitat	Percent of Quail Habitat	Acres Potential* ^b Crucial Summer Quail Habitat	Percent of Quail Habitat	Acres Non-Crucial Quail Habitat	Percent of Quail Habitat
Acton Farrier	45,536	45,536	100	5,009	11	4,554	10	35,973	79
Arrow Canyon	101,698	101,698	100	6,102	6	30,509	30	65,087	64
Azure Ridge	6,914	6,914	100	1,452	21			5,462	79
Billy Goat Peak	48,289	31,870	66	6,760	21			25,110	79
Bunkerville	139,639	97,747	70	54,459	56			43,288	44
Dry Lake	69,339	69,339	100					69,339	100
Flat Top Mesa	5,338	5,338	100	2,402	45			2,936	55
Glendale	22,353	22,353	100	2,235	10			20,118	90
Gold Butte	172,549	172,549	100	124,235	72			48,314	28
Hen Springs	22,756	19,798	87	5,689	29			14,109	71
Jack Rabbit	4,414	4,414	100	1,192	27			3,222	73
Lime Spring	2,384	238	10	238	100				
Lower Monmon	43,640	43,640	100	3,055	7			40,585	93
Mesa									
Mesa Cliff	14,072	14,072	100	2,111	15			11,961	85
Mesquite	13,106	4,587	35	2,359	51			2,228	49
Community									
Muddy Mountain	243,170	243,170	100	24,317	10			218,853	90
Muddy River	20,081	20,081	100	9,036	45			11,045	55
Overton Arm	5,221	5,221	100	3,811	73			1,410	27
Pittman Well	39,595	39,595	100					39,595	100
Pulsipher Wash	3,230	3,230	100	1,260	39			1,970	61
Rox	21,736	21,736	100	217	1			21,519	99
Sunrise	34,272	34,272	100					34,272	100
(Unallotted)									

TABLE .46-22 (continued)
Virgin Valley Planning Unit

GAMBEL'S QUAIL HABITAT BY ALLOTMENT

Allotment	Acres in Allotment	Acres Quail Habitat	Percent of Allotment	Acres Crucial*a Summer Quail Habitat	Percent of Quail Habitat	Acres Potential*b Crucial Summer Quail Habitat	Percent of Quail Habitat	Acres Non-Crucial Quail Habitat	Percent of Quail Habitat
Toquop Sheep	29,793	29,793	100					29,793	100
Upper Mormon Mesa	47,659	47,659	100					47,659	100
Ute	70,280	70,280	100	8,434	12			61,846	88
White Basin	171,360	171,360	100	53,122	31			118,238	69
Unallotted*c	5,481	5,481	100	3,782	69			1,699	31
Lake Mead Nat. Recreation Area*d	157,205	157,205	100	100,611	64			56,594	36
Allotment *e Total	1,561,110	1,489,176	95	421,888	28	35,063	3	1,032,225	69
Planning *f Unit Total	1,485,558	1,413,624	95	421,888	28	35,063	3	956,673	69

*a Area 1.5 mile radius from water becomes vital to survival of quail in summer

*b These are proposed quail guzzler sites

*c Area is part of Lake Mead Nat. Recreation Area, bordered by Sunrise allotment on the west, Muddy Mountain allotment on the east, and the Stateline Planning Unit to the south.

*d That portion of the Lake Mead Nat. Recreation Area bordering the Gold Butte allotment

*e Allotment total does not include the change in total acreage in the Dry Lake, Muddy Mountain and Sunrise Allotments due to change in Planning Unit boundary

*f Planning Unit total includes the change in total acreage in the Dry Lake, Muddy Mountain and Sunrise Allotments due to change in Planning Unit boundary

TABLE .46-23
Stateline Planning Unit

GAMBEL'S QUAIL HABITAT BY ALLOTMENT

Allotment	Acres in Allotment	Acres Quail Habitat	Percent of Allotment	Acres Crucial*a Summer Quail Habitat	Percent of Quail Habitat	Acres Non-Crucial Quail Habitat	Percent of Quail Habitat
Black Butte	36,312	36,312	100			36,312	100
Christmas Tree	89,255	82,115	92	55,338	67	26,777	33
Crescent Peak	119,320	119,320	100	32,216	27	87,104	73
Indian Springs (Unallotted)	6,786	6,786	100			6,786	100
Ireteba Peaks	344,607	344,607	100	144,735	42	199,872	58
Jean Lake	137,217	120,751	88	16,466	14	104,285	86
Kyle Canyon	34,494	16,902	49	345	2	16,557	98
Lucky Strike	138,776	105,470	76	11,102	11	94,368	89
McCullough Mountains	230,272	214,153	93	64,476	30	149,677	70
Newberry	70,384	68,273	97	45,750	67	22,523	33
Roach Lake	14,986	14,986	100			14,986	100
Roach Lake 2222 (Unallotted)	3,732	3,732	100			3,732	100
South Point	22,998	22,998	100	18,628	81	4,370	19
Spring Mountain	310,364	204,840	66	21,725	11	183,115	89
Stump Springs	50,535	50,535	100	10,612	21	39,923	79
Table Mountain	88,537	86,767	98	1,771	2	84,995	98
Vegas Valley (Unallotted)	62,243	62,243	100			62,243	100

TABLE .46-23 (continued)
Stateline Planning Unit

GAMBEL'S QUAIL HABITAT BY ALLOTMENT

Allotment	Acres in Allotment	Acres Quail Habitat	Percent of Allotment	Acres Crucial*a Summer Quail Habitat	Percent of Quail Habitat	Acres Non-Crucial Quail Habitat	Percent of Quail Habitat
Wheeler Wash	129,678	64,839	50	9,077	14	55,762	86
Wheeler Slope	98,952	77,183	78	1,979	3	75,204	97
Younts Spring	23,202	21,114	91	10,209	48	10,905	52
Unallotted *b	27,213	27,213	100	18,313	67	8,900	33
Allotment Total *c	2,039,863	1,751,139	86	462,742	26	1,288,397	74
Planning Unit Total*d	2,115,415	1,826,691	86	462,742	26	1,363,949	74

*a Area 1.5 mile radius from water becomes vital to survival of quail in summer

*b That portion of the Lake Mead National Recreation Area just north of northern boundary of the Ireteba allotment

*c Allotment total does not include the change in total allotment acreage due to change in planning unit boundary

*d Planning Unit total does include the change in total allotment acreage due to change in planning unit boundary

TABLE .46-24
Clark County

HUNTING STATISTICS FOR GAMBEL'S QUAIL

Year	Total Birds Harvested	No. of Hunters	Total Hunter Days	Kill Per Hunter	Kill Per Day	*Percent of State Harvest	*Percent of State Hunters
1979	94,738	5,232	25,811	18.1	3.6	55	39
1978	39,750	3,376	12,883	11.7	3.0	38	35
1977	23,841	3,050	11,276	7.8	2.1	33	36
1976	30,941	3,929	14,232	7.8	2.1	45	40
1975	52,944	4,043	15,888	13.1	3.3	51	41

* In all years Clark County had the highest percentage of birds harvested and the highest number of hunters.

Source for both tables: 1980-1975 Nev. Dept. Wildlife; Upland Game, Migratory Game Birds, Fur Investigations, and Hunting Season Recommendations.

TABLE .46-25
Clark County

DOVE HARVEST 1975-1979

	1975	1976	1977	1978	1979
Total Harvested	44,432.0	66,136.0	35,379.0	41,340.00	50,079.0
Number of Hunters	3,465.0	3,591.0	2,831.0	2,872.00	3,089.0
Total Hunter Days	12,484.0	16,257.0	10,780.0	9,851.0	11,153.0
Kill per Hunter	12.8	18.4	12.4	14.3	16.2
Kill per Day	3.5	4.0	3.2	4.1	4.4

Source: NDW 1976-1980 "Migratory Game Bird Investigations."

TABLE .46-26
Stateline Planning Unit

CRUCIAL SUMMER CHUKAR PARTRIDGE HABITAT

Allotment	Acres in Allotment	Acres of Crucial Summer Chukar Habitat	Percent of Allotment Chukar Habitat
Jean Lake	137,217	9,605	7
McCullough Mountain	230,272	9,211	4
Spring Mountain	310,364	15,518	5
Wheeler Slope	98,952	4,948	5
Wheeler Wash	129,678	5,187	4
TOTAL	906,483	44,469	.005

TABLE .46-27
Clark County

HUNTING STATISTICS FOR CHUKAR PARTRIDGE

Year Hunted	Total Harvested	Number of Hunters	Total Hunter Days	Kill per Hunter	Kill per Day	Percent of State Harvest	Percent of State Hunters
1979	902	168	506	5.3	1.7	.59	.95
1978	462	100	217	4.6	2.1	.42	.68
1977	0	28	56	0	0	0	.30
1976*							
1975	308	31	62	9.9	4.9	.34	.18

* No data collected.

Source: Nevada Department of Wildlife "Upland Game Investigations and Hunting Season Recommendations", 1976-1980.

TABLE .46-28
Clark County

PHEASANT HARVEST 1975-1979

Year	Total Harvested	No. of Hunters	Total Hunter Days	Kill/ Hunter
1979	113	164	263	.6
1978	135	257	340	.5
1977	81	123	135	.6
1976	293	348	550	.8
1975	658	624	1,127	1.0

Source: Nevada Department of Wildlife "Upland Game, Migratory Game
Birds, Fur Investigations and Hunting Season Recommendations"
1976 through 1980.

TABLE .46-29

Clark County

GENERAL RAPTOR DISTRIBUTION AND RELATIVE ABUNDANCE

<u>Raptor Species</u>	<u>Nest Territory or Observation Location</u>	<u>Relative Abundance*</u>	<u>Season of Use</u>
Prairie Falcon	Throughout unit	U-C	Yearlong
Peregrine Falcon	Winter obser. near Lake Mead, Spring, Virgin & Newberry Mountains	R	Winter
Merlin	Valleys as migrant	U	Fall & Spring
Kestrel	Throughout county	C	Yearlong
Goshawk	Timbered mtn. ranges & riparian zones	U	Yearlong
Cooper's Hawk	Riparian types	U-C	Yearlong
Sharp-shinned Hawk	Riparian types & valleys as migrant	O-C	Fall & Spring
Red-tailed Hawk	Throughout county	C	Yearlong
Ferruginous Hawk	Valleys & Foothills	O	Spring & Fall
Rough-legged Hawk	Throughout county	U	Winter
Swainson's Hawk	Valleys & Foothills	O	Spring & Fall
Red-shouldered Hawk	Incomplete information	-	-
Marsh Hawk	Throughout county	U-C	Yearlong
Golden Eagle	Throughout county	U-C	Yearlong
Bald Eagle	Wetlands & reservoirs	U	Winter
Osprey	Reservoirs	U	Winter
Great Horned Owl	Throughout county	U-C	Yearlong
Barn Owl	Throughout county	O-U	Yearlong
Burrowing Owl	Valleys & Foothills	U-C	Yearlong
Elf Owl	Riparian	U-R	Incomplete information
Screech Owl	Throughout county	U	Yearlong

Source: Nevada Department of Wildlife February 1980

*A = Abundant
 C = Common
 U = Uncommon
 O = Occasional
 R = Rare

C. Terrestrial Species - Reptiles and Amphibians

Overlays

Four desert tortoise overlays have been prepared for each planning unit:

Distribution of Desert Tortoise - shows current habitat by density classes, crucial areas, and the locations of two study plots.

1975 ORV Use Classifications in Desert Tortoise Habitat - when overlaid on the distribution overlay, the combination illustrates current ORV management and existing ORV race courses in desert tortoise habitat and crucial areas.

Oil and Gas Leases in Desert Tortoise Habitat - when overlaid on the distribution overlay, the combination shows leases, applications for leases, and known existing seismic lines in desert tortoise habitat and crucial areas.

Roads and Trails in Desert Tortoise Habitat - when overlaid on the distribution overlay, the combination shows paved roads, dirt roads, and trails in desert tortoise habitat and crucial areas.

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Narrative

1. DESERT TORTOISE (*Gopherus agassizi*)

Population History

In 1979, an inventory and two population studies were contracted by the BLM (Contract No. YA-512-CT9-90) to determine the relative density and distribution of desert tortoise, and population condition of two tortoise populations in Clark County, Nevada.

A strip-transect method developed by biologists of the BLM California Desert Program was used to determine tortoise distribution and relative densities on public land throughout Clark County. Transects were 1.5 miles by 10 yards and where terrain permitted were usually walked in an equilateral triangle, one-half mile to a side. Transect methods are described by A.E. Karl (1980). A total of 201 transects in 92 townships (a density of 2.2 transects per 36-square-mile township) were completed in September through November, 1979.

In the Stateline Planning Unit there are a total of 2,054 mi² of desert tortoise habitat. The inventory found:

94 mi ²	of	0-20	tortoises/mi ²
1,349 mi ²	of	21-49	tortoises/mi ²
138 mi ²	of	50-100	tortoises/mi ²
132 mi ²	of	>100	tortoises/mi ²
342 mi ²	of	unknown	tortoise density

In the Virgin Valley Planning Unit there are a total of 2,023 mi² of desert tortoise habitat. The inventory found:

525 mi ²	of	0-20	tortoises/mi ²
586 mi ²	of	21-49	tortoises/mi ²
418 mi ²	of	50-100	tortoises/mi ²
75 mi ²	of	>100	tortoises/mi ²
419 mi ²	of	unknown	tortoise density

Tortoise distribution by relative density is shown on the Tortoise Distribution Overlays.

Two permanent study plots were established for the purpose of determining absolute density, age class structure, sex ratios, and mortality of two different tortoise populations in Clark County, Nevada. The age structure of a population (percentages of hatchlings, juveniles, subadults, and adults) and sex ratios can reveal information on reproductive potential, survivorship, population turnover, and population condition.

Desert tortoise populations can be divided into age or size classes based on carapace length, or based on rings in the scutes (segments of the carapace) in very young animals: hatchlings (no ring); juvenile I ($\leq$ one ring, to 60 mm or 2.4 inches); juvenile II (61 to 100 mm or 2.4 to 4 inches); immature (101 to 180 mm or 4 to 7.2 inches); subadults (181 to 207mm or 7.2 to 8.3 inches); and adults ($>$ 207 mm or over 8.3 inches).

The Piute Valley Study Site is located in Piute Valley, 11.4 miles due south of Searchlight and 2.7 miles due west of U.S. Highway 95. It comprises Section 34 of T.30S. R.63E., located on the Searchlight 15-minute topographic map (see Distribution Overlay for the Stateline Planning Unit). A complete description of the study site and census method used is presented in the report prepared by the contractor (see Karl 1979a).

A total of 84 individuals was marked during the 30-day study: 28 in April, 36 in May, and 20 in June. Karl (1979a), using the method described by Schnabel (1938), estimates the population density to be 125 to 150 tortoises/mi². The age class structure for these animals was 32 adults, 18 subadults, 30 immature, 3 juvenile II, 0 juvenile I, and 1 hatchling (see Table

.46-30). Adults comprised 38 percent of the marked population with sexually immature animals making up the remaining 62 percent. The sex ratio for the 32 marked adult tortoises, 19 males and 13 females, was 146:100 (males:females). The sex ratio for the combination of both adult and subadult tortoises was 79:100 (males:females) for 22 males and 28 females.

Ten tortoise shell remains were located on the study site. The age class structure for these 10 shells was 50 percent adults, 40 percent subadults, and 10 percent juvenile (see Table .46-31). Based on estimated and known time since death for these shell remains (Berry 1973), mortality was estimated at 2.2 percent per year. Natality, or birthrate, was determined to be below mortality due to the low number of dead and live tortoises in the juvenile I and hatchling age classes and the sex ratio of adults, 19 males to 13 females, favoring males.

The Sheep Mountain Study Site is located in Ivanpah Valley 4 miles south-southeast of the town of Jean. It comprises 1 mi² of the adjacent corners of Sections 31 and 32 of T.26S., and Sections 5 and 6 of T.25S., both in R.60E. located on the 15-minute Roach Lake topographic map (see the Distribution Overlay for the Stateline Planning Unit). For a complete description of the site and census methods used, see Karl (1979b).

A total of 32 individuals was marked during the 30-day study: 13 in April, 13 in May, and 6 in June. Karl (1979b) using the method described by Schnabel (1938) estimates the population density to be 50 tortoises/mi². The age class structure for these animals was 20 adults, 2 subadults, 8 immature, 1 juvenile II, 1 juvenile I, and 0 hatchlings (Table .46-32). Adults comprised 62.5 percent of the marked population with sexually immature animals making up the remaining 37.5 percent. The sex ratio for the 20 marked adult tortoises, 10 males and 10 females, was 100:100. The sex ratio for the combination of both adult and subadult tortoises was 120:100 (males:females) or 12 males to 10 females.

Six tortoise shell remains were located on the study site. The age class structure for these 6 shells was 33.3 percent adults, 0 percent subadults, 50 percent immatures, and 16.7 percent juvenile (Table .46-33). Based on estimated and known time since death for these shell remains (Berry 1973), mortality was estimated at 6 percent per year. Natality was determined to be substantially below mortality due to the high percentage of adults (62.5 percent), the low number of dead and live tortoises in the juvenile I and hatchling age classes, and the very low percentage of subadults (6.3 percent) which represent the reproductive potential in the near future for this population.

Life History

Under natural conditions wild tortoise populations are estimated to live 50 to 100 years (Woodbury and Hardy 1948; Hardy 1972). Sexual maturity in wild tortoises requires approximately 15 to 20 years. Limited food availability is suspected of being responsible for the lengthy period of growth prior to sexual maturity (Berry 1978). According to Medica et al. (1975) growth rates in wild tortoises vary from year to year and appear to be related to winter rainfall and annual plant production.

A two-year study by Hohman and Ohmart (1980) in 1977 and 1978 on the Beaver Dam Slope of Arizona (the edge of the most northern distribution of the desert tortoise) showed emergence from winter hibernation on 23 April 1977 and 4 April 1978, with activity continuing into mid-October for both years.

A daily activity pattern consisted of the emergence from a cover site, and many foraging trips, frequently interrupted by short periods of basking beneath a shrub. Upon completion of the daily activity period the tortoise retreated to a cover site, usually the same cover site used the previous day.

Times of daily activity appeared to be influenced by temperature and light. Tortoises were not seen aboveground before dawn or when ground temperatures were less than 64°F. and ambient temperatures less than 72°F. Tortoises were not found aboveground after sundown nor were they active when ground temperatures exceeded 127°F. and ambient temperatures 99°F.

Both daily and seasonal activity appeared to be influenced by temperature. The time of daily emergence from a cover site and the duration aboveground activity varied throughout the active season. Early in the spring (April) tortoises would not leave their cover site until late morning, 9:00 to 10:00 a.m. (MST), and remained aboveground until mid to late afternoon, 3:00 to 4:00 p.m. (MST). As temperatures increased in the summer months, activity was reduced to mornings only. By late June and early July, tortoises were active as early as 5:20 a.m. (MST) and were underground again by 9:00 a.m. (MST).

Precipitation appears to influence tortoise activity. Two to three weeks after a period of precipitation, aboveground tortoise activity increases. A two- or three-week delay before activity increased is probably a natural response that has developed to allow the annual plants that sustain tortoise to germinate (Hohman and Ohmart 1980).

Observations of wild tortoises laying eggs are limited to observations which included clutches of 4 to 6 or more eggs (Berry 1974; Burge and Bradley 1976; Burge 1977b). Fitch (1970) postulates that tortoises are like other reptiles, in that young, small females lay smaller clutches than the older, larger females. Berry (1978) indicates that there may be a gradual decrease in clutch size as females approach senility. Based on observed weight losses of 16 female tortoises in Ivanpah Valley, California in 1980, Turner et. al (1981) estimate that two clutches of eggs were laid, one in May and one in June.

Berry (1978) defines tortoise home range as "the area in which it forages, burrows, travels, and interacts with other animals." Home range size is determined by geographic locality, population density, and food supply. Berry (1974) in Salt Wells Valley, California and Burge (1977a) near Arden, Nevada both indicate that large tortoises have large home ranges, and small tortoises have small home ranges. In Utah, Woodbury and Hardy (1948) and Coombs (1977) reported home range sizes of 4 to 40 hectares (ha) (10 to 100 acres) and 0.2 to 7.3 ha (0.5 to 18 acres), respectively. Berry (1974) reported home range sizes for most males between 39 and 77 ha (96 to 190 acres) and for some males, 129 to 259 ha (319 to 640 acres). Females ranged over 8 to 45 ha (19 to 112 acres) in Salt Wells Valley, California. Burge (1977a) near Arden, Nevada reported home ranges of 20 to 38 ha (49 to 94 acres) for males and 11.3 to 27 ha (28 to 66.7 acres) for females.

According to Berry and Nicholson (in prep.), there are certain characteristics which determine a healthy undisturbed tortoise population. The population should consist of 40 to 50 percent adults, with at least 5 to 15 percent in the combined hatchling and juvenile tortoise classes. The adult to nonadult ratio should be close to 60 to 100 adults to 100 nonadults. Sex ratios of adults, or adults and subadults combined, should be almost 1:1. A higher ratio of females to males would be more desirable than the reverse. Mortality rates, averaged over several years, should equal or be slightly lower than average recruitment rates of hatchling and juvenile tortoises.

According to Berry and Nicholson (in prep.) a minimum density of 100 or more tortoises/mi² is needed to maintain a viable tortoise population. For instance, in a population of 50 tortoises/mi², there are only 10 to 12 breeding females/mi². This number of breeding females/mi² is considered inadequate to maintain a viable population; whereas, a population of 100 tortoises/mi² with twice as many breeding females would have a greater potential to maintain a viable population.

The ability of a population to maintain itself depends not only on density, but also on total size. In the past, tortoise populations were of higher density, covered hundreds to thousands of square miles, and were to some extent continuous. Today, there are few areas with more than 100 tortoises/mi² that extend for more than 50 to 200 mi² without interruption. The majority of the existing populations are small, low density populations which are more susceptible to extinction from natural accidents and catastrophes than larger, higher density populations. The threshold at which a tortoise population might drift into an irreversible decline is estimated by Berry and Nicholson (in prep.) to be any population with a density below 50 tortoises/mi². They pointed out that even high density populations of ≥ 200 tortoises/mi² are unlikely to maintain themselves in a small area, unless disturbance in adjacent areas is minimal.

Natality data is limited to 12 intensively studied wild tortoise populations including eight populations in California, one population in Utah, three populations in Nevada, and two populations in Arizona. Natalty is expressed as the percent of hatchlings produced per year as compared to the total population. (Actually, the number of hatchlings found would be more accurate. Small tortoises are more difficult to find than larger individuals and may be underestimated in any population sample.) Because hatchlings are probably not produced every year, the estimate of annual production should be averaged over a several year period. To date, the Utah population has yielded sufficient data to do this.

In the eight populations in California and two populations in Arizona, hatchlings composed 0 to 6 percent of the population (Berry 1978). Three populations in Nevada showed that hatchlings composed 1.5 percent of the population at the Arden site (Burge and Bradley 1976), 0 percent of the population at the Sheep Mountain site near Jean (Karl 1979b), and 1.2 percent of the population at the Piute Valley study site (Karl 1979a). In Utah hatchlings averaged 1.4 percent of the population over 30 years (Coombs 1977).

Data from seven tortoise populations indicates mortality is generally quite low, but it appears to exceed natality. A population in Utah showed a mortality of one percent per year for a ten-year period (Woodbury and Hardy 1948). Coombs (1977) estimated the mortality for the same population in 1974-1976 to be 3.4 percent. Three populations in southern Nevada show the following mortality rates: 4.2 percent at the Arden study site (Burge and Bradley 1976), 4 percent at the Sheep Mountain study site near Jean (Karl 1979b), and 9 percent at the study site in Piute Valley (Karl 1979a). A population near Picacho Peak,

Arizona showed a mortality of less than 2 percent per year, and a population near Littlefield, Arizona averaged 20 percent per year (Hohman and Ohmart 1980). A low density population in Salt Wells Valley, California indicated a mortality rate of less than 5 percent (Berry 1974).

Food

Tortoises usually emerge from hibernation in late winter or early spring (February to April) and forage on annual wildflowers, annual and perennial grasses, and some perennial shrubs. Genera of annual forbs utilized are Astragalus, Camissonia, Coreopsis, Cryptantha, Erodium, Euphorbia, Gilia, Lupinus, Malacothrix, Mentzelia, Phacelia, Plantago, Stylocline, Eriogonum, Amsinckia, Chaenactis, and Lepidium. Annual grasses include such species as Bouteloua barbata, Bromus rubens, Festuca octaflora, and Schismus barbatus. Perennial grasses utilized are Hilaria rigida, Muhlenbergia porteri, and Oryzopsis hymenoides. Shrubs are used relatively little overall, except for herbaceous types like Sphaeralcea ambigua. Tortoises also have been observed utilizing flowers, fruits, and new stem tips of Stephanomeria pauciflora, Krameria parvifolia, Echinocactus polycephalus, Opuntia basilaris, Opuntia ramosissima, Hymenoclea salsola, Ceratoides lanata, Salvia sp., Bebbia juncea, Larrea divaricata, and Tamarix chinensis. Wildflowers and grasses compose most of the diet in late winter and spring. As these foods become limited, tortoises will utilize perennial grasses and dried annuals. (Woodbury and Hardy 1948; Berry 1974, 1975; Burge and Bradley 1976; Burge 1977b, 1977c; Cook 1977; Coombs 1977; Nicholson 1977a, 1977b; Karl 1979a, 1979b; Hohman and Ohmart 1980.)

Water

The desert tortoise is not dependent on free water. It is capable of obtaining "metabolic water" through the oxidation of plant materials (Minnich 1977) and the use of water stored in its urinary bladder (Minnich 1977; Nagy and Medica 1977).

In the northeastern Mojave Desert, such as the Tule Desert in Lincoln County, Nevada, most of the annual plants utilized by the tortoise bloom between autumn and late spring, provided that autumn rainfall is adequate (Beatley 1974). Unfortunately, the major portion (60 percent) of the tortoises' annual activity period occurs well after the annuals have bloomed and dried up. Therefore, tortoises are forced to utilize dry vegetation. The ability of tortoises to utilize dry vegetation may be related to their relatively high body water content and their tolerance of osmotic stress (Nagy and Medica 1977).

Tortoises appear to be able to anticipate precipitation and construct shallow basins in the soil several hours before rainfall occurs (Nagy and Medica 1977). The ability to store some of this rainfall in its urinary bladder could allow the tortoise to consume dry plants through the summer (Nagy and Medica 1977).

Cover

In Nevada the desert tortoise occupies the following plant communities:

Joshua Tree Woodland (Yucca brevifolia, Juniperus spp., Eriogonum fasciculatum and Lycium spp.)

Shadscale (Atriplex confertifolia, Eurotia lanata, Grayia spinosa, Menodora spinescens and Coleogyne ramosissima)

Alkali Sink (Atriplex spp., and Suaeda torreyana)

Creosote Bush Scrub

Cover sites provide the cold-blooded tortoise protection from fatal temperatures. Cover-types include the burrow, den, and nonburrow cover. Burge (1980) defines a burrow as a subsurface cavity formed by erosion, excavated by a tortoise, excavated by other animals, or any combination of these. The minimum depth of a burrow is defined by the size of the individual. For example, a hatchling's burrow would be a minimum of about 30 centimeters deep. The shape of the opening of a tortoise burrow can be described as a well-defined half circle with a flat bottom. Usually the size and shape of the burrow opening and interior conform to the size and shape of the tortoise.

A tortoise den is a type of burrow but, unlike a burrow it usually widens at the opening and interior depths to widths greater than the inhabiting tortoise and is usually multi-chambered. Dens are usually found in the banks of desert washes which have been formed by cemented layers of consolidated gravels (Woodbury and Hardy 1948; Burge 1980).

Nonburrow cover includes exposed shaded ground, low overhanging branches of shrubs, and below surface cavities which only partially cover the tortoise. A pallet is nonburrow cover in which the overhanging soil only partially covers the shell of the tortoise, or where the only roof is a shrub canopy or a boulder (Burge 1980).

These cover types are usually found within washes, and in upland areas between washes on dissected alluvial fans at elevations between 1,000 and 5,000 feet.

Habitat Condition

Presently there are no parameters for determining the condition of desert tortoise habitat. However, the density of the tortoise population in an area is an indicator of the condition of the habitat. The estimated habitat condition for each planning unit is shown in Table .46-34.

Important Use Areas

Those areas which have relative densities of ≥ 50 tortoises/mi² are considered to be crucial desert tortoise habitat because of the following factors:

A minimum density of 100 or more tortoises/mi² is needed to maintain a viable tortoise population; the threshold at which a tortoise population might drift into an irreversible decline is estimated to be any population below a density of 50 tortoises/mi²; and because of all desert tortoise habitat, only 13 percent (270 mi²) in the Stateline Planning Unit and only 25 percent (494 mi²) in the Virgin Valley Planning Unit have a relative density of ≥ 50 tortoises/mi² (see the Tortoise Distribution Overlays).

Special Use Areas

No special use areas for desert tortoise have been delineated in Clark County.

Conflicts

Livestock Conflicts: Seventy percent (2,246 mi²) of the Stateline Planning Unit has been licensed to livestock grazing since 1975. Sixty-three percent (2,054 mi²) of the planning unit is desert tortoise habitat, of which 13 percent (270 mi²) is crucial. Seventy-four percent (1,512 mi²) of the desert tortoise habitat is grazed by livestock, of which 14 percent (212 mi²) is considered to be crucial desert tortoise habitat. All of the grazed desert tortoise habitat is being grazed March through May, the most critical period of the year for the desert tortoise.

Seventy percent (1,074 mi²) of the grazed desert tortoise habitat is classified as ephemeral-perennial range and 30 percent (437 mi²) as ephemeral range. Of the crucial desert tortoise habitat grazed, 54 percent (114 mi²) is classified as ephemeral-perennial range and 46 percent (97 mi²) as ephemeral range. Cattle are the only class of

livestock grazing on 67 percent of the desert tortoise habitat; 5 percent domestic horses only; 1 percent cattle, domestic sheep and horses; 26 percent cattle and domestic sheep; and 1 percent cattle and domestic horses. Of the crucial desert tortoise habitat grazed, 58 percent is grazed only by cattle, 39 percent by cattle and domestic sheep, and 3 percent by cattle, domestic horses and sheep (see Table .46-35).

Eighty-two percent (1,914 mi²) of the Virgin Valley Planning Unit has been licensed to livestock grazing since 1975. Eighty-five percent (2,022 mi²) of the planning unit is desert tortoise habitat with 25 percent (492 mi²) of it being crucial desert tortoise habitat. Eighty-four percent (1,693 mi²) of the desert tortoise habitat is grazed by livestock, of which 23 percent (389 mi²) is considered to be crucial desert tortoise habitat. All of the grazed desert tortoise habitat is being grazed March through May, the most critical period of the year for the desert tortoise.

All of the grazed desert tortoise habitat, is classified as ephemeral range. Cattle are the only class of livestock grazing 61 percent of the desert tortoise habitat; 6 percent domestic sheep only; 6 percent cattle, domestic horses, and sheep; and 27 percent domestic horses and cattle. Of the crucial desert tortoise habitat grazed, 62 percent is grazed by only cattle, 25 percent is grazed by domestic horses and cattle, and 13 percent by cattle, domestic horses, and sheep (see Table .46-36).

Certain life history characteristics and behaviors render the desert tortoise susceptible to the environmental changes caused by cattle and domestic sheep grazing. These include its low reproductive potential, the long period between hatching and age at first reproduction, low survival of young, low population turnover, reliance on annual and perennial grasses and annual wildflowers for food, limited periods for feeding, small home range size in females and young individuals, and burrowing habits. Sheep and cattle have the potential for removing forage, damaging or destroying perennial shrubs used for shelter, and crushing burrows and small tortoises, especially where grazing is intensive. Grazing-induced population declines in tortoises may be reflected in size class structure by a preponderance of adults and in sex ratios where males outnumber females (Berry 1978). Grazing can have a greater impact on adult female tortoises than on males because of the heavy metabolic demands of egg laying. Eggs are laid in late spring and early summer, usually after winter annuals have

dried and succulent green forage is no longer available. The spent female may have to wait until the following spring to replenish fat reserves and perhaps a second or third year if there is a drought or continuous competition from livestock for available forage. Thus females recently depositing eggs may be more likely to suffer stress and greater mortality than males of similar size (Berry 1978).

A two-year study by Hohman and Ohmart (1980) on the Beaver Dam Slope in Arizona in 1977 and 1978, revealed that both cattle and tortoises depend primarily on spring annual forbs and grasses at the beginning of spring with the diet of tortoises shifting gradually and the diets of cattle shifting sharply to shrubs as the season progresses. Hohman and Ohmart's explanation for the seasonal shift in diets by tortoises and cattle is plant availability. As the spring season progressed the succulent annual forbs and grasses cured and shrubs became the only succulent plants available.

The study also showed that the percent of dietary overlap decreases sharply as the season progresses and may vary in magnitude from year to year. (The percent of dietary overlap is a similarity index expressing the percentage of two diets that are identical.) Shift in diet due to plant availability is responsible for the sharp seasonal decrease in the percent of dietary overlap. The change in abundance and diversity of annual forbs and grasses due to precipitation changes is responsible for the change in magnitude from year to year.

In 1977, as result of poor annual production, the percent of dietary overlap in April was 40 percent, and 18 percent in May. Contrastingly in 1978, as a result of good annual production, the percent of dietary overlap in April was 80 percent, and 24.5 percent in May.

Hohman and Ohmart point out that, even though their study indicates that the index of dietary overlap in dry years is lower than in wet years, the competition between tortoises and cattle may be more intense than indicated by the index of dietary overlap. Their hypothesis is supported by the fact that both tortoises and cattle are preferential grazers, not browsers, consequently, during dry years such as 1977, when succulent forbs and grasses were scarce, competition could become more intense.

Spring annual forbs and grasses contain the essential nutrients necessary to sustain reproduction (egg production, etc.). Reproduction may be suppressed when these spring annual forbs and grasses are nonexistent or present in

insufficient quantity to sustain reproduction, along with the existence of intense livestock competition for the small quantity of annuals that do exist. If suppressed reproduction continues for any extended length of time a tortoise population which naturally has low recruitment potentials and long maturation periods, could be adversely affected to the point of extinction by insufficient reproduction.

In the spring of 1978 Webb and Stielstra (1978) initiated a study in the western Mojave Desert of California to determine the effects of domestic sheep grazing on vegetation. All study plots were in current or former high density tortoise habitat. They reported that in one "pass" through an area, sheep removed 60 percent of the annuals in the coppice mounds of creosote bushes and trampled 24 to 28 percent of the annuals in the intershrub areas. In areas where sheep graze frequently, and in bedding or watering sites, the reduction in annuals was much more severe. Sheep also reduced the cover of perennial shrubs of such species as burrobrush by 16 to 19 percent and spiny hopsage by 29 percent. Volume of burrobrush was 21 to 65 percent less in heavily than in lightly grazed areas; goldenhead was 68 percent less. These shrubs are common species in tortoise habitat in the Western Mojave and are frequently used as cover sites by tortoises. The overall effect of sheep grazing on vegetation used by tortoises for food, water, and cover is severe.

Off-Road Vehicle Conflicts: Off-road vehicle use on the desert can have severe environmental consequences. Impacts on soils have been documented by Webb and Stielstra (1978), Wilshire and Nakata (1976), and Davidson and Fox (1974). Mechanical disturbance of the soil upsets the water storage and penetration capacities, thermal structure, and can disrupt the time of seed germination.

Destruction of vegetation has been documented by Davidson and Fox (1974), Lathrop (1978), Bury et al. (1977), and others. Most vegetation is destroyed through crushing and or root exposure. Impacts to vertebrate populations in general have been described by Stebbins (1974) and Luckenbach (1975). Bury et al. (1977) and Busack and Bury (1974) studied ORV effects on vertebrates in desert tortoise habitat. They noted declines in numbers and biomass of vertebrates, with impacts becoming increasingly severe in moderately and intensively used ORV areas. Severe declines and extirpations of desert tortoises were noted by Bury (1978) in heavily used ORV areas.

Bury et al. (1977) initiated a study to examine the impact of ORVS, primarily motorcycles, on creosote shrub habitat and associated small vertebrates (reptiles, mammals, and birds) in the western California desert. All 16 study sites were within the creosote shrub association with creosote, Larrea tridentata, being the dominant plant species by aspect. There were differences in subdominant perennial plants, ground cover and substrata. Comparisons were made at eight paired sites. Four categories of habitat quality based on the creosote shrub indices (number of shrubs not broken, half-broken, dead, etc.) were established: control, moderate use, heavy use, and pit area.

Control Site: No pristine sites could be located within the study area. Sites chosen were relatively free of ORV tracks and the few single tracks which did exist were considered to have no or slight impact.

Moderate Use: These areas had high creosote shrub counts with about half the forage disrupted; most shrubs were intact at the base. Soil and ground vegetation were disturbed between shrubs, which is a sign of moderate use because initially, ORVs travel around rather than through shrubs.

Heavy Use: Shrub numbers and indices were appreciably reduced in these areas; ground cover was absent and obvious destruction of creosote shrubs had occurred, including ORV tracks through individual shrubs, cut branches, and crushed plants.

Pit Areas: These areas were usually used for camping and/or ORV staging areas; much debris and litter were present. Most shrubs and ground cover were absent or pulverized, and the soil was heavily compacted.

Through extrapolation of Bury's data, one can estimate the effect of motorcycle ORVs on one square mile of creosote shrub habitat (creosote shrub habitat is representative of desert tortoise habitat). An undisturbed site would contain approximately 17,228 small vertebrates. A moderate use site would contain 15,078 small vertebrates (a reduction of 2,150 animals) a heavy ORV use site 9,456 small vertebrates (a reduction of 7,772 animals), and a pit area would represent a loss of all 17,228 small vertebrates.

ORV impacts include killing or maiming of individuals, breaking shrubs which provide cover, and collapsing of

burrows which provide the cold-blooded tortoise protection from fatal temperatures. Recruitment can become a significant factor when these impacts cause high mortality within a desert tortoise population which naturally has a low recruitment rate and requires 15 to 20 years for maturity. Death or removal of a sexually mature tortoise (especially a female) will result in a loss not only of the individual but also of its reproductive potential.

The Stateline and Virgin Valley Planning Units have not been formally designated into off-road vehicle use classifications (open, closed, limited). However, since finalization of each respective MFP in 1975, the BLM has managed each planning unit as if it were formally designated. Analysis of how interim ORV classifications affect desert tortoise habitat in Clark County is as follows.

Of the 2,054 mi² of desert tortoise habitat within the Stateline Planning Unit, 1 percent (15 mi²) is classified as closed, 36 percent (745 mi²) open, 19 percent (400 mi²) limited type 1, 5 percent (94 mi²) limited type 2, 22 percent (458 mi²) limited type 3, and 17 percent (341 mi²) limited type 4.

Thirteen percent (270 mi²) of the desert tortoise habitat within the planning unit is considered to be crucial tortoise habitat. Only 6 percent (15 mi²) of this crucial tortoise habitat is classified as closed. Forty percent (108 mi²) is classified as open, 13 percent (36 mi²) limited type 1, and 41 percent (110 mi²) limited type 3 (see the 1975 ORV Use Classifications in Tortoise Habitat Overlay and Table .46-37).

Of the 2,023 mi² of desert tortoise habitat within the Virgin Valley Planning Unit, 5 percent (99 mi²) is classified as closed, 32 percent (639 mi²) open, 23 percent (459 mi²) limited 1, 11 percent (230 mi²) limited 2, 9 percent (176 mi²) limited 3, and 20 percent (419 mi²) limited 4. Twenty-four percent (493 mi²) of the desert tortoise habitat within the planning unit is considered to be crucial tortoise habitat. None of this crucial habitat is classified as closed. Forty-one percent (203 mi²) is classified open, 29 percent (145 mi²) limited 1, 14 percent (69 mi²) limited 2, and 16 percent (76 mi²) limited 3 (see the 1975 ORV Use Classifications in Tortoise Habitat Overlay and Table .46-38).

Also see Tables .46-39 and .46-40 for the amounts of existing competitive courses in tortoise habitat in the county.

Open areas permit unrestricted ORV use. Of all of the ORV classifications, open is the one most responsible for declines and extirpations of desert tortoise populations. The impacts of competitive ORV use to desert tortoise populations are considered to be much more severe than the impacts of individual ORV use because competitive use is much more intense, with intensity increasing with the number of participants, course lengths, number and size of pit areas, number of course laps, and the number and activity of spectators and the damage created by them. There is a greater probability of killing and maiming of individual tortoises both aboveground or in burrows, and a greater potential for destruction and elimination of shrubs and burrows which provide protection from fatal temperatures. There is also a greater potential for reduction in the availability of important forage plants through destruction and through inhibition of seed germination as a result of soil erosion and compaction.

Lack of ORV use restrictions permits the movement from a heavily used ORV area to an area of no ORV use, increasing the potential to kill and maim individual tortoises and to destroy more tortoise habitat.

Limited type 1 areas prohibit competitive ORV use and restrict individual ORV use to existing roads, trails, and washes. As previously stated, the impacts of competitive ORV use on desert tortoise populations are considered much more severe than the impacts of individual ORV use. The prohibition of competitive ORV use in these areas is advantageous to the survival of desert tortoise populations. Impacts of individual ORV use are dependent on the location, frequency, intensity, time of year, and type of ORV use. ORV use during the tortoises' active period (March through September) increases the possibility of killing or maiming tortoises. Consequently this impact is reduced or eliminated if ORV use of roads, trails, and washes is conducted during their inactive period (October through February). However, ORV use of certain trails and washes during the inactive period for tortoises could be detrimental in other ways. The vegetation (tortoise food and cover) along trails and in washes is subject to destruction and erosion. The degree of destruction and erosion is dependent on location, frequency, type, and intensity of ORV use.

A study by Wilshire et al. (1978) illustrates the differences in impacts of vehicle use on bedrock, soils, terrain, and vegetation, considering such factors as

precipitation, duration and type of use, and types of management.

In limited type 2 areas both competitive and individual ORV use are limited to existing roads, trails, and washes. Competitive or individual ORV use during the active period of the desert tortoise (March through September) would make it susceptible to being killed or maimed. The same impacts which were described under limited type 1, for ORV use of certain trails and washes during the inactive period of the desert tortoise also apply here but with the impacts of competitive ORV use being greater.

In limited type 3 areas, individual ORV use is unrestricted and competitive ORV use is limited to existing roads, trails, and washes. The impacts of unrestricted ORV use are the same as described under open ORV classification and the impacts of limited competitive ORV use are the same as described under limited type 2 ORV classification.

Limited type 4 areas are within the Lake Mead National Recreation Area. Both competitive and individual ORV use are restricted to designated roads, trails, and washes. The impacts described under limited type 2 ORV classification apply here except that the impacts can be mitigated through the designation of trails and washes that do not impact desert tortoise populations.

Oil and Gas Leasing Conflicts: Thirty-four percent (699 mi²) of the tortoise habitat in the Stateline Planning Unit has been leased, 28 percent (577 mi²) has pending applications and 38 percent (779 mi²) has no applications for oil and gas leases. Thirty-nine percent (104 mi²) of the crucial tortoise habitat in the planning unit has been leased, 21 percent (58 mi²) has pending applications, and 40 percent (108 mi²) has no applications for oil and gas leases (see Table .46-41 and the Oil and Gas Leases within Tortoise Habitat Overlay).

Sixty percent (1,214 mi²) of the desert tortoise habitat in the Virgin Valley Planning Unit has been leased, 27 percent (541 mi²) has pending applications, and 13 percent (268 mi²) has no applications for oil and gas leases. Eighty-three percent (408 mi²) of the crucial desert tortoise habitat in the planning unit has been leased, and 17 percent (85 mi²) has pending applications for oil and gas leases (see Table .46-42 and the Oil and Gas Leases within Tortoise Habitat Overlay).

Oil and gas leasing per se does not necessarily impact tortoises until development of leases occurs. Development impacts tortoise populations in the following ways: habitat is lost from new roads, drill pads and sumps; and increased collecting or killing of tortoises occurs from additional access provided by roads and resulting increased vehicle use on and off roads.

Oil and Gas Exploration Conflicts: One-hundred-fourteen miles of oil and gas seismic lines traverse 2,054 mi² of desert tortoise habitat within the Stateline Planning Unit, a density of .06 miles of seismic line per 1 mi² of desert tortoise habitat. (see Table .46-43).

Three-hundred-forty-five miles of oil and gas seismic lines traverse 2,023 mi² of desert tortoise habitat within the Virgin Valley Planning Unit, a density of .17 miles of seismic line per 1 mi² of desert tortoise habitat. Eighty-five miles of oil and gas seismic lines traverse 493 mi² of crucial desert tortoise habitat, a density of .17 miles of seismic line per 1 mi² of crucial desert tortoise habitat (see Table .46-44 and the Oil and Gas Leases within Tortoise Habitat Overlay).

Seismic crews, vehicles, and equipment are permitted to travel indiscriminately off-road where they deem it necessary to gather data. Off-road vehicle travel, as previously discussed under Off-Road Vehicle Conflicts, can be most deleterious to the survival of individual desert tortoises. Impacts include killing or maiming of individuals, breaking of shrubs, collapsing of burrows which provide cover, and reduction of important food sources through destruction of plants and disturbance of soil.

The impacts of seismic activity in desert tortoise habitat are compounded by the fact that more than one oil company may run its own exploration lines through the same general area, thus multiplying the number of seismic lines traversing an area.

Conflicts with Roads and Trails: Desert tortoise habitat (2,054 mi²) in the Stateline Planning Unit is traversed by 382 miles of paved roads, 1,114 miles of dirt roads, and 821 miles of trails (see Table .46-45). This is a density of 1.14 miles of road or trail per 1 mi² of tortoise habitat.

Desert tortoise habitat (2,023 mi²) in the Virgin Valley Planning Unit is traversed by 388 miles of paved roads, 614 miles of dirt roads, and 672 miles of trails (see Table

.46-.46). This is a density of .83 miles of road or trail per 1 mi² of tortoise habitat. See the Roads and Trails In Tortoise Habitat Overlays.

A study by Nicholson (1978) in the California Mohave Desert showed that paved roads and vehicular traffic have a detrimental effect upon tortoise populations within about a kilometer (.58 miles) of a road. Although the study did not consider dirt roads and trails it is believed that they may have the same detrimental effect. The degree of effect upon a tortoise population adjacent to a paved road is dependent on the age, width and traffic volume of the road. The decrease in tortoise densities adjacent to roads presumably is a result of mortality from vehicular collisions or removal by passing motorists. Considering the number of roads and trails traversing tortoise habitat within the county, roads and trails may be a major factor contributing to the reduction of tortoise populations.

Interaction with Man

For tortoise populations adjoining areas of human occupation or inhabiting areas that receive many human visitors, vandalism and collection could become a serious problem. Under Nevada laws and regulations, there is adequate provision for protection of tortoise in the wild. It is illegal to hunt, trap, possess, or transport tortoises in Nevada (Nevada Revised Statutes 503.030, 503.597, 503.600, 503.585, 503.584, and 501.065). Under a new law, General Regulation No. 1, the State can classify a native species with an endangered status. Under this regulation, the tortoise in Nevada is classified as rare and protected (Lucas 1976).

Harvest

Not applicable.

Nonconsumptive Use

Nevada Department of Wildlife estimates that approximately 7,000 tortoises have been illegally picked up as pets and transported to the City of Las Vegas (Lucas 1976).

Habitat Loss or Change

In addition to the habitat losses outlined in the Conflicts section, 700 mi² in the Stateline Planning Unit (primarily Las Vegas Valley) and 138 mi² in the Virgin Valley Planning Unit (including the Moapa, Glendale, Overton areas) of previously occupied tortoise habitat have been lost as a result of private land development.

*** Opportunities

Transects are a good method for determining tortoise distribution and relative density. The 1979 tortoise survey had an average of 2.2 transects/township (36 mi²). The reliability of transects for estimating population densities increases with higher transect numbers. To better outline actual population boundaries or pockets of lower or higher population densities within a particular region, more transects are needed. To increase the accuracy of the 1979 density tortoise class boundaries, the transect densities should be increased to 6 transects/township or higher in crucial areas (50 or more tortoises/mi²). This would require an additional 351 transects. There is also a need to survey the 760 mi² of tortoise habitat (Lake Mead National Recreation Area plus Valley of Fire State Park) that was not surveyed in 1979. BLM administers the grazing licensing in these areas, and is therefore responsible for the grazing impacts that may occur. This would require a minimum of 42 transects to obtain a density of 2 transects/township or a maximum of 126 transects for a density of 6 transects/township.

A permanent study plot is a good method for determining and monitoring the condition of a tortoise population. Data collected from a permanent study plot provides the necessary population parameters (density, age/size class structure, mortality and recruitment, and sex ratios) for determining population condition. There are only 2 permanent study plots in important desert tortoise crucial areas in the county. Ten more permanent study plots should be added in Clark County for the purpose of determining and monitoring population condition in other desert tortoise crucial areas. The number of plots and location by desert tortoise crucial area (C-DT-#) is as follows: Stateline Planning Unit - 1 plot in C-DT-8, near Goodsprings; 1 plot in C-DT-7, Red Rocks; and 2 plots in C-DT-11, Piute Valley (see the Distribution of Desert Tortoise Overlay for the Stateline Planning Unit).

Virgin Valley Planning Unit - 2 plots in C-DT-1, north of Moapa; 1 plot in C-DT-2, Arrow Canyon; 1 plot in C-DT-3, California Wash; 1 plot in C-DT-5, Virgin Mountains; and 1 plot in C-DT-6, Horse Spring Wash (see the Distribution of Desert Tortoise Overlay for the Virgin Valley Planning Unit).

In areas of crucial desert tortoise habitat where grazing by livestock is considered to be a significant factor in contributing to the decline in manageable desert tortoise populations, it will be necessary to prohibit livestock from grazing (particularly ephemeral vegetation) March through May, the time of year when the competition for existing forage

(particularly spring annual forbs and grasses) is the most critical for the desert tortoise. Because of the severity of the impacts of domestic sheep on desert tortoise habitat grazing should not be permitted in the same areas of use 2 years in succession. In addition, only one pass by domestic sheep should be permitted through an area in any one grazing season.

Oil and gas exploration, especially seismic activity, in crucial desert tortoise habitat should be restricted to the edges of existing roads, trails, and washes and to the time of the year when the desert tortoise is in hibernation, October through February. Exceptions would be if men and equipment were flown into the exploration site by helicopter, or if travel was accomplished on horseback.

Oil and gas development should be prohibited in tortoise crucial areas where possible. Where development can not be prevented, the following stipulations should be applied.

Restrict the size of the area disturbed during drilling operations to the minimum size necessary to do the job.

Where feasible, restrict access to drill sites to existing roads and trails.

Restrict drilling activity to the time of year when the desert tortoise is in hibernation (October through February).

After unsuccessful drill sites have been abandoned each drill site should be seeded with native shrubs, forbs, and grasses.

After unsuccessful drill sites have been abandoned, any newly constructed access roads should be rendered inaccessible to motorized vehicles.

Coordination with District wildlife personnel should be conducted prior to initiation of any development activity.

Competitive ORV use in crucial desert tortoise habitat should be prohibited. Competitive ORV use in non-crucial desert tortoise habitat should be restricted to existing roads and designated trails and washes, and to the time of year when the desert tortoise is in hibernation, October through February.

Future research should concentrate on determining the effects of different kinds of impacts on desert tortoise populations; evaluating minimum forage requirements for reproducing females; and determining forage values of annual wild flowers and annual and perennial grasses.

Habitat management plans for the desert tortoise crucial areas should be developed considering the previously discussed conflicts and opportunities.

2. GILA MONSTER (Heloderma suspectum)

The Gila monster, a State of Nevada rare species, is one of only two venomous lizards in the world. The neurotoxic venom of this species is produced in modified salivary glands in the lower jaw. "The venom is not injected by means of fangs, but is free flowing and is chewed into the wound by the grooved teeth. The Gila monster is famous for its tenacity; it hangs on tightly when biting. Modified teeth which draw the venom by their capillary action quickly become bathed in the venom and, as the lizard continues to chew, increasing amounts of venom enter the wound. To disengage the reptile from its victim as quickly as possible is thus important. No human deaths appear to be uncontestably attributable solely to the bite of the Gila monster." (Larson 1977 p. 205). They pose almost no threat to the person who avoids them or simply observes them from a respectful distance.

"Gila monsters are dormant during the coldest months, diurnal in moderate temperatures, and primarily nocturnal during the hottest months. Their irregular color pattern serves in dim light to conceal them. Against a dark background, the black portions of the pattern blend, and the light markings appear to be sticks, rocks, or the like. On a light background, the reverse occurs. The Gila monster retreats to burrows of other animals, digs its own, or enters pack rat nests or natural cavities. It is most common on the lower slopes of desert mountains, ranging onto the outwash plains, and may also be found in canyons and along washes where water, which it appears to need during its active period, may be available. Three to eleven eggs are produced by the mature female after the summer rains have begun. These eggs are buried about five inches deep in sand or soft soil. Gila monsters are thought to live to an age of twenty-five to thirty years. Their food consists of bird and reptile eggs and small mammals, such as young rabbits and rodents, which are killed by means of the lizard's venom" (Larson 1977 p. 204).

Important Habitat

"The lower Colorado River drainage, Moapa and Virgin Valleys and Meadow Valley Wash are key Gila monster habitat" (NDW, February 1980). The range of this animal in Clark County appears to be below 4,000 feet in elevation with rocky or sandy washes being preferred habitat (Deacon and Bradley 1965).

The washes identified on the Nongame Bird Habitat Overlay should be considered important Gila monster habitat also.

Conflicts

ORV activity, particularly competitive activity in the washes identified as important habitat, may be detrimentally affecting gila monsters (Pratt, UNLV Museum Natural History, personal communication 1981).

*** Opportunities

BLM, Nevada Department of Wildlife, UNLV, National Park Service, and other agencies and individuals have sight records or have seen Gila monsters in various locations in Clark County. A comprehensive map and record showing the locations and habitat these animals were found in needs to be completed. Such a record and map could be used by BLM to allow more exact management and protection of the Gila monster on the Las Vegas District.

The type of habitat displayed as important washes on the Nongame Birds Habitat Overlay appears to be preferred habitat for Gila monsters. Competitive ORV use should be prohibited in these washes. Closer inspection may warrant also limiting noncompetitive ORV use in these areas.

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TABLE .46-30
Clark County

AGE CLASS AND SEX OF DESERT TORTOISES MARKED ON THE
PIUTE VALLEY STUDY SITE

Size Class	Sex			Total	Percent
	Unknown	F	M		
Hatchling (no ring*)	1	—	—	1	1.2
Juvenile I (< 1 ring, to 60 mm**)	—	—	—	0	0.0
Juvenile II (61-100 mm)	3	—	—	3	3.8
Immature (101-180 mm)	29	—	1	30	35.7
Subadult (181-207 mm)	—	15	3	18	21.4
Adult (> 207 mm)	—	13	19	32	38.1
Totals	33	28	23	84	100

* Refers to the rings in the scutes, or scales of the tortoise's shell;
similar to growth rings in fish scales.

** Maximum length of the carapace, or shell protecting the tortoise's back.

TABLE .46-31
Clark County

TORTOISE SHELL REMAINS FOUND ON THE PIUTE VALLEY STUDY SITE

Size Class	Sex			Total	Percent
	Unknown	F	M		
Hatchling	—	—	—	0	0
Juvenile I	—	—	—	0	0
Juvenile II	1	—	—	1	10.0
Immature	—	—	—	0	0
Subadult	—	3	1 ⁺	4	40.0
Adult	2 ⁺	—	3 ⁺⁺	5	50.0
Total	3	3	4	10	100

+ Fragment groups. Sex identification is not absolute.

++ Probable sex and size class reported. One individual was possibly a subadult and one was possibly a female.

TABLE .46-32
Clark County

AGE CLASS AND SEX OF DESERT TORTOISES MARKED ON THE
SHEEP MOUNTAIN STUDY SITE

Size Class	Sex			Total	Percent
	Unknown	F	M		
Hatchling (no ring*)	—	—	—	0	0
Juvenile I (<1 ring, to 60 mm **)	1	—	—	1	3.1
Juvenile II (61-100 mm)	1	—	—	1	3.1
Immature (101-180 mm)	7	—	1	8	25.0
Subadult (181-207 mm)	—	—	2	2	6.3
Adult (>207 mm)	—	10	10	20	62.5
Total	9	10	13	32	100.0

* Refers to the rings in the scutes, or scales of the tortoise's shell;
similar to growth rings in fish scales.

** Maximum length of the carapace, or shell protecting the tortoise's back.

TABLE .46-33
Clark County

TORTOISE SHELL REMAINS FOUND ON THE SHEEP MOUNTAIN STUDY SITE

Size Class	Sex			Total	Percent
	Unknown	F	M		
Hatchling (no ring)	—	—	—	0	0
Juvenile I (<1 ring, to 60 mm)	—	—	—	0	0
Juvenile II (61-100 mm)	1	—	—	1	16.7
Immature (101-180 mm)	3	—	—	3	50.0
Subadult (181-207 mm)	—	—	—	0	0
Adult (>207 mm)	—	—	2	2	33.3
Total	4	0	2	6	100.0

TABLE .46-34
Clark County

DESERT TORTOISE HABITAT CONDITION

Tortoise Density (No./mi ²)	Stateline Tortoise (mi ²)	Habitat Condition	Virgin Valley Tortoise (mi ²)	Habitat Condition
0-20	94	very poor	525	very poor
21-49	1,349	poor	586	poor
50-100	138	fair	418	fair
>100	132	good	75	good
undetermined	342	undetermined	419	undetermined
	<u>2,054</u>		<u>2,023</u>	

TABLE 46-35
Stateline Planning Unit

DESERT TORTOISE HABITAT WITHIN LIVESTOCK GRAZING ALLOTMENTS

Allotment Name	Class of Livestock	Carrying Capacity-Perennial AIMS *	Average Licensed Use ** (AIMs)	Season of Use	Allotment		Tortoise Habitat Sq. Mi.	% of Allotment	Tortoise Habitat (Sq. Mi.)				Density Classes (Sq. Mi.)							
					Sq. Mi. *a	Acres			Crucial	% of Habitat	Unsurveyed for Tortoise	% of Habitat	0-20	% Habitat	21-49	% Habitat	50-100	% Habitat	> 100	% Habitat
Black Butte	C	0	56	Yearlong	57	36,312	56	99	—	—	—	—	—	—	56	100	—	—	—	—
Christmas Tree	C	0	2,502	Yearlong	140	89,255	132	94	72	54	35	27	—	—	25	19	44	33	28	21
	S		1,209																	
Crescent Peak	C	778	5,986	Yearlong	186	119,320	127	68	49	38	—	—	—	—	78	62	3	2	45	36
Indian Springs (Unallotted)	—	—	—	—	11	6,786	11	100	—	—	—	—	10	100	—	—	—	—	—	—
Ireteba	C	1,295	1,849	Yearlong	538	344,607	477	89	43	9	211	44	20	4	203	43	—	—	43	9
Jean Lake	C	2,228	3,529	Yearlong	214	137,217	139	65	6	5	—	—	5	3	128	92	6	5	—	—
Kyle Canyon	—	0	0	No Use	54	34,494	17	31	—	—	—	—	—	—	17	100	—	—	—	—
Lucky Strike	H	65	240	Yearlong	217	138,776	64	30	—	—	—	—	—	—	64	100	—	—	—	—
McCollough Mt.	C	3,027	2,670	Yearlong	360	230,272	285	79	11	4	—	—	54	19	220	77	11	4	—	—
	S																			
Newberry	—	482	0	No Use	110	70,384	108	98	9	8	53	49	—	—	46	43	9	8	—	—
Roach Lake	C	146	292	Yearlong	23	14,986	20	85	—	—	—	—	2	10	18	90	—	—	—	—
Roach Lake 2222 (Unallotted)	—	0	0	—	6	3,732	1	19	—	—	—	—	—	—	1	100	—	—	—	—
South Point	C	17	216	Yearlong	36	22,998	36	100	—	—	—	—	—	—	36	100	—	—	—	—
Spring Mts.	—	1,391	—	No Use	485	310,364	190	39	51	27	—	—	—	—	139	73	51	27	—	—
Stump Springs	C	238	228	Yearlong	79	50,535	79	100	4	6	—	—	—	—	74	94	4	6	—	—

TABLE .46-35 (continued)
Stateline Planning Unit

DESERT TORTOISE HABITAT WITHIN LIVESTOCK GRAZING ALLOTMENTS

Allotment Name	Class of Livestock	Carrying Capacity- Perennial ALMs *	Average Licensed Use ** (ALMs)	Season of Use	Allotment		Tortoise Habitat Sq. Mi.	% of Allotment	Tortoise Habitat (Sq. Mi.)				Density Classes (Sq. Mi.)							
					Sq. Mi. *a	Acres			Crucial	% of Habitat	Unsurveyed for Tortoise Habitat	% of Habitat	0-20	% Habitat	21-49	% Habitat	50-100	% Habitat	> 100	% Habitat
Table Mtn.	C	0	174	Yearlong	138	88,537	15	11	15	100	—	—	—	—	—	—	—	—	16	100
Vegas Valley (Unalotted)	—	64	—	—	97	62,243	67	69	—	—	—	—	—	—	67	100	—	—	—	—
Wheeler Wash	C	446	1,251	May-Nov 15	203	129,678	46	23	5	10	—	—	—	—	42	90	5	10	—	—
Wheeler Slope	—	0	—	No Use	155	98,952	55	36	—	—	—	—	—	—	55	100	—	—	—	—
Younts Spring	H	0	149	Yearlong	36	23,202	18	49	—	—	—	—	—	—	18	100	—	—	—	—
Unalotted *b	—	—	—	—	42	27,213	42	100	—	—	42	100	—	—	—	—	—	—	—	—
Allotment Total *c					3,187	2,039,863	1,985	62	265	14	341	17	91	4	1,287	65	133	7	132	7
Planning Unit Total *d					3,257	2,084,330	2,054	63	270	13	341	17	94	4	1,349	66	138	7	132	6

* 1979 Range Survey

** For years actually used from 1975 through 1979

*a Due to conversion of acreage figures to mi² figures and rounded to nearest whole number columns and rows do not total to the exact same figures

*b That portion of the Lake Mead National Recreation Area just north of northern boundary of the Iretaba allotment

*c Allotment total does not include the change in total allotment acreage due to change in planning unit boundary

*d Planning unit total does include the change in total allotment acreage due to change in planning unit boundary

TABLE 4-6-36
Virgin Valley Planning Unit

DESERT TORTOISE HABITAT WITHIN LIVESTOCK GRAZING ALLOTMENTS

Allotment Name	Class of Livestock	Carrying Capacity-Perennial AUMs *	Average Licensed Use ** (AUMs)	Season of Use	Allotment		Tortoise Habitat Sq. Mi. *a	% of Allotment	Tortoise Habitat (Sq. Mi.)				Density Classes (Sq. Mi.)							
					Sq. Mi.	Acres			Crucial	% of	Unsurveyed	% of	0-20	% Habitat	21-49	% Habitat	50-100	% Habitat	> 100	% Habitat
					*a															
Acton Farrier	C	0	53	March-May	71	45,536	62	87	62	100	—	—	—	—	—	—	62	100	—	—
Arrow Canyon	C	49	304	March-May	159	101,698	150	94	40	27	—	—	30	20	80	53	40	27	—	—
				Sept-Nov																
Azure Ridge* ^b	—	—	—	—	11	6,914	11	100	—	—	—	—	11	100	—	—	—	—	—	—
Billy Goat Peak	C	1	1,397	Yearlong	75	48,289	37	49	26	71	—	—	—	—	11	29	10	28	16	43
Bunkerville	C	31	304	March-May	218	139,639	137	63	44	32	19	14	29	22	44	32	44	32	—	—
	H		13																	
	S		428	Sept-Nov																
Dry Lake	C	109	199	March-May	108	69,339	106	98	30	27	—	—	6	5	71	67	17	16	13	12
Flat Top Mesa	C	0	44	March-May	8	5,338	8	100	—	—	—	—	8	100	—	—	—	—	—	—
	H		4	Sept-Nov																
Glendale	C	0	0	No Use	35	22,353	35	100	35	100	—	—	—	—	—	—	35	100	—	—
Gold Butte	C	0	2,730	Yearlong	270	172,549	246	91	44	—	—	—	202	82	—	—	39	16	5	12
Hen Springs	C	0	867	March-May	36	22,756	28	80	—	—	—	—	—	—	28	100	—	—	—	—
				Sept-Jan																
Jack Rabbit	C	0	204	March-May	7	4,414	7	100	—	—	—	—	7	100	—	—	—	—	—	—
				Sept-Nov																
Lower Mormon	C	189	498	March-May	68	43,640	68	100	—	—	2	3	53	77	14	20	—	—	—	—
Mesa	H		114	Sept-Nov																
Mesa Cliff	C	128	134	March-May	22	14,072	22	100	—	—	—	—	22	100	—	—	—	—	—	—
	H		5																	
Mesquite	C	0	0	No Use	20	13,106	7	33	—	—	—	—	—	—	7	100	—	—	—	—
Community																				
Muddy Mountain	C	0	154	March-May	380	243,170	359	94	75	21	84	24	52	14	147	41	75	21	—	—
	H		53																	

TABLE .46-36 (continued)
Virgin Valley Planning Unit

DESERT TORTOISE HABITAT WITHIN LIVESTOCK GRAZING ALLOTMENTS

Allotment Name	Class of Livestock	Carrying Capacity-Perennial AUMs *	Average Licensed Use ** (AUMs)	Season of Use	Allotment		Tortoise Habitat Sq. Mi.	% of Allotment	Tortoise Habitat (Sq. Mi.)				Density Classes (Sq. Mi.)							
					Sq. Mi.	Acres			Crucial	% of Habitat	Unsurveyed for Tortoise	% of Habitat	0-20	% Habitat	21-49	% Habitat	50-100	% Habitat	> 100	% Habitat
Muddy River	C	0	0	No Use	31	20,081	22	69	—	—	3	16	2	8	17	76	—	—	—	—
Overton Ann	C	0	0	No Use	8	5,221	8	100	—	—	3	37	5	63	—	—	—	—	—	—
Pittman Well	C	118	0	No Use	62	39,595	60	97	35	58	—	—	5	8	21	34	24	40	11	18
Pulsipher Wash	C	0	90	March-May	5	3,230	5	100	—	—	—	—	5	100	—	—	—	—	—	—
				Sept-Nov																
Rox	C	0	0	No Use	34	21,736	34	100	34	100	—	—	—	—	—	—	34	100	—	—
Sunrise	—	0	0	No Use	54	34,272	52	97	—	—	—	—	—	—	52	100	—	—	—	—
(Unallotted)																				
Toquop Sheep	S	58	393	March-May	47	29,793	47	100	—	—	—	—	24	52	22	48	—	—	—	—
Upper Mormon	C	320	742	March-May	74	47,659	74	99	73	98	—	—	—	—	1	2	43	57	30	41
Mesa	H		37	Sept-Nov																
Ute	C	0	107	March-May	110	70,280	99	90	—	—	—	—	8	8	92	92	—	—	—	—
White Basin	C	103	997	March-May	268	171,360	245	91	—	—	146	59	58	24	41	17	—	—	—	—
				Sept-Nov																
Unallotted *c	—	—	—	—	9	5,481	9	100	—	—	9	100	—	—	—	—	—	—	—	—
Lake Mead	—	—	—	—	246	157,205	153	62	—	—	153	100	—	—	—	—	—	—	—	—
Nat. Rec. Area *d																				
Allotment Total *e					2,436	1,558,726	2,091	86	498	24	419	20	527	25	647	31	423	20	75	4
Planning Unit Total *f					2,366	1,514,259	2,022	85	492	25	419	20	525	26	586	29	418	21	75	4

- *a Due to conversion of acreage figures to mi² figures and rounded to nearest whole number columns and rows do not total to the same figures
- *b Allotment administered by Arizona Strip District; grazed yearlong by cattle, carrying capacity of entire allotment (Arizona portion and Nevada portion) 1,188 AUMs
- *c Area is part of Lake Mead National Recreation Area bordered by Sunrise allotment on the West side, Muddy Mountain Allotment on the East side, and the Stateline Planning Unit to the South
- *d That portion of the Lake Mead National Recreation Area bordering the Gold Butte Allotment
- *e Allotment total does not include the change in total acreage in the Dry Lake, Muddy Mtn., and Sunrise Allotments due to change in planning unit boundary
- *f Planning unit total includes the change in total acreage in the Dry Lake, Muddy Mtn., and Sunrise Allotments due to change in planning unit boundary

TABLE 46-37
Stateline Planning Unit

1975 ORV USE CLASSIFICATIONS WITHIN DESERT TORTOISE HABITAT

Tortoise Density (no./sq. mi.)	Tortoise Habitat		Tortoise Habitat in ORV Use Classifications *a												Limited 3 f			Limited 4 g		
	(Sq. Mi)	(Acres)	Open b			Closed c			Limited 1 d			Limited 2 e			Sq. mi. *	Acres	%	Sq. mi. *	Acres	%
			Sq. mi.*	Acres	%	Sq. Mi*	Acres	%	Sq Mi*	Acres	%	Sq. Mi*	Acres	%						
0-20	94	59,910	70	44,932	75	0	0	0	0	0	0	0	0	0	24	14,978	25			
21-49	1,349	863,532	567	362,683	42	0	0	0	364	33,154	27	94	60,477	7	324	207,248	24			
50-100	138	88,471	45	29,103	33	15	9,749	11	27	7,482	20	0	197	0	50	31,940	36			
100+	132	84,245	63	40,438	48	0	0	0	9	5,897	7	0	0	0	60	37,910	45			
Unknown h	341	218,502																341	218,502	100
Total	2,054	1,314,660	745	477,156	36	15	9,749	1	400	256,533	19	94	60,674	5	458	292,076	22	341	218,502	100

* Square miles are rounded to nearest whole.

a ORV use classifications are MFP decisions made in 1975 for the Stateline Unit. They represent current District Management of recreational ORV activities.

b OPEN AREAS: Unrestricted ORV use.

c CLOSED AREAS: Closed to all ORV use, unless expressly authorized by BLM.

d LIMITED TYPE 1: Areas where competitive ORV use is prohibited, and individual ORV use is limited to existing roads, trails and washes.

e LIMITED TYPE 2: Areas where individual and competitive uses are limited to existing roads, trails and washes.

f LIMITED TYPE 3: Areas where individual use is unrestricted and competitive use is limited to existing roads, trails and washes.

g LIMITED TYPE 4: Area within Lake Mead National Recreation Area; competitive and individual ORV use restricted to designated roads, trails, and washes.

h Area not surveyed for desert tortoise.

TABLE .46-38
Virgin Valley Planning Unit

1975 ORV USE CLASSIFICATIONS WITHIN DESERT TORTOISE HABITAT

Tortoise Density (no./sq. mi.)	Tortoise Habitat		Tortoise Habitat in ORV Use Classifications *a																	
	(Sq. Mi)	(Acres)	Open b			Closed c			Limited 1 d			Limited 2 e			Limited 3 f			Limited 4 g		
			Sq. mi.*	Acres	%	Sq. Mi*	Acres	%	Sq Mi*	Acres	%	Sq. Mi*	Acres	%	Sq. mi. *	Acres	%	Sq. mi. *	Acres	%
0-20	525	335,657	173	110,767	33	11	6,713	2	268	171,185	51	26	16,783	5	47	30,209	9			
21-49	586	374,796	264	168,658	45	88	56,219	15	46	29,984	8	135	86,203	23	53	33,732	9			
50-100	418	267,276	192	122,947	46	0	0	0	113	72,165	27	46	29,400	11	67	42,764	16			
100+	75	47,888	11	6,704	14	0	0	0	32	20,592	43	23	14,845	31	9	5,747	12			
Unknown h	419	268,181																419	268,181	100
Total	2,023	1,293,798	639	409,076	32	99	62,932	5	459	293,926	23	230	147,231	11	176	112,452	9	419	268,181	100

* Square miles are rounded to nearest whole.

a ORV use classifications are MFP decisions made in 1975 for the Virgin Valley Planning Unit. They represent current District Management of recreational ORV activities.

b OPEN AREAS: Unrestricted ORV use.

c CLOSED AREAS: Closed to all ORV use, unless expressly authorized by BLM.

d LIMITED TYPE 1: Areas where competitive ORV use is prohibited, and individual ORV use is limited to existing roads, trails and washes.

e LIMITED TYPE 2: Areas where individual and competitive uses are limited to existing roads, trails and washes.

f LIMITED TYPE 3: Areas where individual use is unrestricted and competitive use is limited to existing roads, trails and washes.

g LIMITED TYPE 4: Area within Lake Mead National Recreation Area; competitive and individual ORV use restricted to designated roads, trails, and washes.

h Area not surveyed for desert tortoise.

TABLE .46-39
Stateline Planning Unit

MILES OF COMPETITIVE ORV COURSE WITHIN
DESERT TORTOISE HABITAT

Tortoise Density (Mi ²)	Tortoise Habitat (Mi ²)	Miles of Competitive ORV Courses	Miles of Course Per Mi ² Habitat
0-20	94	38	.40
21-49	1,349	435	.32
50-100	138	74	.53
>100	132	112	.84
Unknown	340	0	0
TOTAL	2,054	659	.32

TABLE .46-40
Virgin Valley Planning Unit

MILES OF COMPETITIVE ORV COURSE WITHIN
DESERT TORTOISE HABITAT

Tortoise Density (Mi ²)	Tortoise Habitat (Mi ²)	Miles of Competitive ORV Courses	Miles of Course Per Mi ² Habitat
0-20	525	43	.08
21-49	586	117	.20
50-100	418	89	.21
>100	75	7	.09
Unknown	419	0	0
TOTAL	2,023	256	.13

TABLE .46-41
Stateline Planning Unit

OIL AND GAS LEASES WITHIN DESERT TORTOISE HABITAT

Tortoise Density (no./mi ²)	Tortoise Habitat (mi ²)	Habitat with Applications Pending (mi ²)	Percent total Habitat	Habitat Leased (mi ²)	Percent total Habitat	Habitat with no Applications	Percent total Habitat
0-20	94	46	49	15	16	33	35
21-49	1,349	459	34	580	43	310	23
50-100	138	41	30	62	45	35	25
>100	132	17	13	42	32	73	55
Unknown	341	14	4	0	0	328	96
TOTAL	2,054	577	28	699	34	779	38

TABLE .46-42
Virgin Valley Planning Unit

OIL AND GAS LEASES WITHIN DESERT TORTOISE HABITAT

Tortoise Density (no./mi ²)	Tortoise Habitat (mi ²)	Habitat with Applications Pending (mi ²)	Percent total Habitat	Habitat Leased (mi ²)	Percent total Habitat	Habitat with no Applications	Percent total Habitat
0-20	525	163	31	304	58	58	11
21-49	586	88	15	498	85	0	0
50-100	418	71	17	347	83	0	0
>100	75	14	19	61	81	0	0
Unknown	419	205	49	4	1	210	50
TOTAL	2,023	541	27	1,214	60	268	13

TABLE .46-43
Stateline Planning Unit

SEISMIC LINES WITHIN DESERT TORTOISE HABITAT

Tortoise Density (Mi ²)	Tortoise Habitat (Mi ²)	Miles of Seismic Lines	Miles Seismic Line Per Mi ² Habitat
0-20	94	8	.09
21-49	1,349	102	.08
50-100	138	4	.03
>100	132	0	0
Unknown	340	0	0
TOTAL	2,054	114	.06

TABLE .46-44
Virgin Valley Planning Unit

SEISMIC LINES WITHIN DESERT TORTOISE HABITAT

Tortoise Density (Mi ²)	Tortoise Habitat (Mi ²)	Miles of Seismic Lines	Miles Seismic Line Per Mi ² Habitat
0-20	525	151	.29
21-49	586	108	.18
50-100	418	76	.18
>100	75	9	.12
Unknown	419	0	0
TOTAL	2,023	345	.17

TABLE .46-45
Stateline Planning Unit

MILES OF ROADS AND TRAILS WITHIN DESERT TORTOISE HABITAT

Tortoise Density (No/mi ²)	Tortoise Habitat (mi ²)	Paved Roads (mi)	Miles of Paved Road per Mi ² Habitat	Dirt Roads (mi)	Miles of Dirt Road Per Mi ² Habitat	Trails (mi)	Miles of Trail per Mi ² Habitat	Total Roads and trails (mi)	Miles of Roads and Trails per Mi ² Habitat
0-20	94	14	.15	73	.78	51	.54	138	1.47
21-49	1,349	260	.19	545	.40	569	.42	1,374	1.02
50-100	138	30	.22	67	.49	88	.64	185	1.34
>100	132	5	.04	100	.76	91	.69	196	1.48
Unknown Density	341	73	.21	359	1.05	22	.06	454	1.33
Total	2,054	382	.19	1,144	.56	821	.40	2,347	1.14

TABLE .46-46
Virgin Valley Planning Unit

MILES OF ROADS AND TRAILS WITHIN DESERT TORTOISE HABITAT

Tortoise Density (No/mi ²)	Tortoise Habitat (mi ²)	Paved Roads (mi)	Miles of Paved Road per Mi ² Habitat	Dirt Roads (mi)	Miles of Dirt Road Per Mi ² Habitat	Trails (mi)	Miles of Trail per Mi ² Habitat	Total Roads and trails (mi)	Miles of Roads and Trails per Mi ² Habitat
0-20	525	74	.14	246	.47	210	.40	530	1.01
21-49	586	122	.20	181	.31	230	.39	533	.91
50-100	418	97	.23	87	.21	171	.41	355	.85
>100	75	26	.34	16	.21	13	.17	55	.73
Unknown Density	419	69	.16	84	.20	48	.11	201	.48
Total	2,023	388	.19	614	.30	672	.33	1,674	.83

D. Aquatic Species

Overlays

One overlay has been prepared for each planning unit, showing habitat of aquatic species, called the Water Fowl and Aquatic Species Habitat Overlay.

Tabulations

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Other tabulations called for in the Manual are either discussed in the narrative or are unavailable.

Narrative

1. Fish

a. Virgin Valley Planning Unit

Fisheries Habitat: The only fish habitats in the planning unit on BLM administered lands are the Moapa River and the Virgin River. The Colorado River and Lake Mead were not included in this discussion because neither of these habitats occur on land administered by BLM and would not be affected by BLM planning decisions. Meadow Valley Wash does not support a fishery resource in the planning unit.

The Moapa River occurs almost entirely on private land on the Moapa Indian Reservation. Only a small portion of the river occurs on public lands and reclamation withdrawals; however, the Moapa River is discussed because of the significance of the endemic fish found in the river.

The Virgin River traverses public land, private land, and land within the Lake Mead National Recreation Area. Table .46-47 shows the ownership status of land crossed by the Virgin River, from Arizona to Lake Mead.

TABLE .46-47
LAND STATUS ALONG THE VIRGIN RIVER
(From Arizona to Lake Mead)

<u>Ownership Status</u>	<u>Miles</u>
Lake Mead NRA	1.58
Private Land	12.38
Public Land	12.55
Total	26.51

The U.S Fish and Wildlife Service developed a Stream Evaluation Project that was to be utilized by state wildlife management agencies.

"The overall goal of this project is to establish and publish maps depicting the relative value of stream fisheries and distribute them to State and local governments, Federal development agencies, industrial users, the environmental community, and the public. It is expected that this information will be used by these agencies to direct development away from highly valued fishery resources" (Statement of Work, USFWS Stream Evaluation Project, 1976).

Tables .46-48 and .46-49 show the Nevada Stream Evaluation Criteria Matrix for the Moapa (Muddy) River and the Virgin River. The Moapa River has an overall rating of I, as a highest-valued fishery resource. The Virgin River has an overall rating of I from the Arizona line to the Riverside Bridge, and an overall rating of III, or as a substantial fishery resource, from the Riverside Bridge to Lake Mead. See Table .46-52 for the species code list used on the evaluations, and Table .46-53 for a list of the Stream Class definitions used above. Also see the Aquatic Species Overlay.

(1) Migratory Fish

No migratory fish occur within the planning unit.

(2) Resident Fish

(a) Game Fish

Population History: Six game fish are found in the Virgin Valley Planning Unit and are listed below. These fish are introduced species, and their distribution is shown on Table .46-54.

Black Bullhead (Ictalurus malas)
Bluegill (Lepomis macrochirus)
Channel Catfish (Ictalurus punctatus)
Green Sunfish (Chaenobryttus cyanellus)
Largemouth Bass (Micropterus salmoides)
Rainbow Trout (Salmo gairdneri)

The value of these fish as a fishery resource is limited. No data relative to population trends or habitat status is available for these species. Intensive surveys to determine population trends of these species or their habitat status are not warranted at the present time.

Harvest: No data is available for the harvest of game fish on the planning unit.

(b) Nongame Fish

Population History: Nongame fish are found in the Moapa River (Muddy River) and the Virgin River. Table .46-54 shows the distribution of nongame fish in the planning unit. (Deacon and Bradley 1972; Cross 1975, 1976; Hardy 1979)

Endangered, rare, and threatened species, as recognized by both Federal and State governments, are discussed in a separate section. Introduced nongame species are not discussed in this section. These have no significance other than their probable negative impact on native fishes.

Desert Sucker: "The sucker is not extremely common in the Virgin River and is most abundant in those reaches in Utah and Arizona" (Hardy 1979).

Flannelmouth Sucker: "This species inhabits portions of the Virgin River along the extreme southeastern portions of the state. Its main distribution in the river occurs in Utah and the Arizona Strip but it is found in reduced numbers in the lower reaches near Mesquite, Nevada...The Virgin River is only one of several systems that this animal is found in..." (Hardy 1979).

Moapa River Roundtail: "This undescribed subspecies in the Moapa River has received little attention from investigators other than noting its occurrence in this River." (Hardy 1979).

*** Studies should be initiated to determine the abundance and distribution of this fish.

Virgin River Speckled Dace: "This subspecies is doing quite well in the Virgin River along its entire length." (Hardy 1979)

*** The distribution and abundance of this nongame fish should be determined for the Moapa and Virgin Rivers where they traverse public land.

Harvest: There is a possibility that fathead minnows, golden shiners, and red shiners are harvested for use as bait. However, no harvest data is available for these species. There is no harvest of any other nongame fish in the planning unit.

Management Techniques: There are no management actions directed specifically at nongame fishes in the planning unit at present, other than those classified as endangered, rare, or threatened.

Conflicts:

Desert Sucker: Removal of water from the Virgin River for agricultural purposes probably has a negative impact on this species.

Flannelmouth Sucker: This fish has been impacted in recent years by agricultural diversions and habitat modifications (Hardy 1979).

Moapa River Roundtail: No specific conflicts relative to this species have been identified for the Moapa River.

Virgin River Speckled Dace: Threats identified for the Virgin River Roundtail apply also to this species (Hardy 1979). (See Conflict discussion of Virgin River Roundtail under Endangered, Rare, and Threatened Fish.)

(c) Endangered, Rare, and Threatened Fish

Table .46-55 lists the endangered, rare, and threatened fish that occur in the Virgin Valley Planning Unit, and provides classification information on each species.

Population History:

Moapa Dace: "This species is confined to the first two miles of the headwaters of the Moapa River. It has experienced severe decline in numbers over the past several years as a result of exotic fish introductions and habitat alterations. Recently a refuge was established in the headwaters and efforts to reintroduce the fish are underway. Life history studies are underway and should be completed in the spring of 1980...." (Hardy 1979).

A recovery plan has been drafted for this fish. None of the fish's habitat occurs on public land; therefore, BLM has no involvement in the plan.

Moapa River Speckled Dace: "This subspecies occurs along the mid-reaches of the Moapa River and has never been taken in any quantity" (Hardy 1979).

**** Studies should be undertaken to determine life history, current distribution, and population status of this fish.

Moapa White River Springfish: "This subspecies is confined to the headwaters of the Moapa River approximately 9 miles west of Glendale, Nevada. It has experienced several population declines since the introduction of Gambusia affinis in the 1930s and Poecilia mexicana in the early 1960s. Since then, field collections in 1978-79 indicate that they are stabilizing and have increased somewhat since these early periods..." (Hardy 1979).

The habitat of this species is not located on public land; therefore, BLM has no management authority over its habitat.

Virgin River Roundtail: "This subspecies is found throughout the Virgin River though only sporadically abundant. Collections over the past several years indicate a need for deep pool habitats in this river system" (Hardy 1979).

*** Studies should be made to determine the life history of this fish.

Woundfin: An approved recovery plan has been written for this species. The recovery team recommended that all of the Virgin River in Nevada be classified as critical habitat (USDI 1979).

The woundfin (Plagopterus argentissimus) appears to prefer primarily runs with riffles, and pools are of secondary importance. It also seems to prefer sandy bottoms over rubble and cobble bottoms and over mud and silt bottoms. The fish are frequently associated with some type of cover such as overhanging deadfalls, brush, and trees. Woundfin occur in greatest abundance in habitats that have not been physically modified. The woundfin prefers swift waters and a sandy substrate. It appears that the distribution of the woundfin is controlled by substrate, turbidity, and possibly, high salinity (Cross 1975).

The woundfin is very well adapted to fluctuating habitat conditions (discharge, suspended sediment, temperature) of the mainstream Virgin River (Cross 1975).

Analysis of stomach contents of 14 woundfins produced the following food items: amorphous material (presumably organic) and sand grains were most abundant; insects were commonly found (aquatic insect larvae, especially diptera, were predominant; ants and other terrestrial insects were rare); filamentous algae and organic detritus occurred in about one half of the individuals; amphipod larvae were found in two specimens (Cross 1975).

Cross (1975) found ripe tuberculated individuals in May. Fry and juvenile fish were found from early June to mid-August with the young woundfin generally occupying shallow areas lateral to the main current. There is a general lack of data relative to the reproductive biology of the woundfin.

"This species continues to hold out in the face of major habitat alterations and water diversions. Field surveys conducted in 1979 indicate poor reproduction in the upper river reaches of Utah. In fact, collections made in December over several miles of river produced a total of only 13 specimens. Collections in October in the same area resulted in only 38 specimens. Other native species were common in October but rare in the December collections. Habitat partitioning studies for

the Virgin River will be concluded in the spring of 1980 and food habits are currently under study. It is recommended that intensive field surveys be conducted this spring to determine if the December collections were aberrant or indicative of the entire system..." (Hardy 1979).

Harvest: There is no harvest of rare, endangered, or threatened fish in the planning unit.

Management Techniques:

Moapa Dace: The BLM has no specific management responsibility for the Moapa dace.

Moapa River Speckled Dace: Little is known about the life history, distribution, or population status of this subspecies. Presently, no management actions are being conducted specifically for this species.

*** There is an opportunity to maintain or enhance the habitat of this species and other native fish of the Moapa River through development of a Habitat Management Plan (HMP).

Moapa White River Springfish: Presently, no management actions are being conducted specifically for this species.

Virgin River Roundtail: The life history of this species needs to be studied. No management actions are being conducted specifically for this species. *** There is an opportunity to maintain or enhance the habitat of this fish through development of a Habitat Management Plan (HMP). The management of the habitat of this species should be addressed in the HMP proposed for the woundfin.

Woundfin: An approved recovery plan has been written for this fish, with the BLM identified for several major management roles. The woundfin has also been identified as the target species for a proposed HMP.

*** The entire Virgin River in Nevada has been recommended as critical habitat by the Woundfin Recovery Team (Woundfin Recovery Team 1979). The Virgin River is an environmentally sensitive area and efforts should be made to protect it where it traverses public land. The BLM has an opportunity to accomplish its roles identified in the approved recovery plan, including: development of a habitat management plan with the

woundfin as the target species; and maintenance of all public land adjacent to the Virgin River in public ownership.

Conflicts:

Moapa River Speckled Dace: The Endangered Species Committee of the American Fisheries Society (Deacon et al. 1979) lists threats to this species as follows: the present or threatened destruction, modification, or curtailment of its habitat or range; disease; other natural or man-made factors affecting its continued existence, such as hybridization, introduction of exotic or translocated species, predation, and competition.

Moapa White River Springfish: High numbers of exotic fish and modifications of habitat for agricultural purposes are threats to this species. The continued withdrawal of groundwater in this area for power plant usage and the MX missile system may lead to loss of habitat (Hardy 1979).

Virgin River Roundtail: The Endangered Species Committee of the American Fisheries Society (Deacon et al. 1979) lists a threat to this species as the present or threatened destruction, modification, or curtailment of its habitat or range. Some major threats to this species are the proposed development of the Allen-Warner Valley Power Project and agricultural diversions (Hardy 1979).

The major cause of the decline of this subspecies seems to be the reduced discharge of the Virgin River during the agricultural growing season. Water quality has decreased due to irrigation returns, leaching, and sewage effluents.

Large segments of potential chub habitat are often dry due to reduced flow. This results in crowding of fishes in isolated pools causing increased predation, spread of disease and parasites, and increased competition for food and space. The results of these factors are a reduction in fitness and often high mortalities (Cross 1975).

Woundfin: The Endangered Species Committee of the American Fisheries Society (Deacon et al. 1979) lists a threat to this species as the present or threatened destruction, modification, or curtailment of its habitat or range.

Major threats to this species include major habitat modifications caused by agricultural and domestic water diversions, and from the proposed Allen-Warner Valley Power Project (Hardy 1979).

The red shiner (Notropis lutrensis), an exotic, appears to have replaced the woundfin in the lowermost portions of the Virgin River. Predation by other introduced species is also a likely limiting factor of woundfin. Drying of stretches of the Virgin River during heavy irrigation use causes loss of habitat due to dewatering of portions of the river. The continued existence of the woundfin within the Virgin River system is directly linked to the amount of further physical, chemical, and biological alteration of the mainstem habitat (Cross 1975).

b. Stateline Planning Unit

Fisheries Habitat: Cold Creek and Willow Creek received plants of rainbow trout (Salmo gairdneri) in past years. No plants of fish have been made within the past few years. Rising fuel and labor costs make planting trout into these marginal habitats impractical.

A population of reproducing rainbow trout occurs in Willow Creek; however, the trout habitat in this creek is limited to less than one mile.

Tables .46-50 and .46-51 show the Nevada Stream Evaluation Criteria Matrix for Cold Creek and Willow Creek. (This rating system is explained in the Virgin Valley Planning Unit discussion). Cold Creek has an overall rating of IV, as a limited fishery resource, and Willow Creek has an overall rating of I, as a highest-valued fishery resource. See Table .46-52 for the species code list used on the evaluations, and Table .46-53 for a list of the Stream Class definitions used above. Also see the Aquatic Species Overlay.

(1) Migratory

No migratory fish occur within the planning unit.

(2) Resident Fish

(a) Game Fish

Population History: Rainbow trout (Salmo gairdneri) have been planted in past years in Cold Creek and Willow Creek. A reproducing population of trout exists in Willow Creek and no significant population of trout occurs in Cold Creek. No reproduction is known to have occurred in Cold Creek. No data are available for the number of fish in Willow Creek.

Harvest: Fishermen harvest trout from Willow Creek but no data are available on the number of fish harvested.

Management Techniques: No management practices have been directed in the past specifically for the propagation of rainbow trout or for the protection of their habitat.

*** Opportunity: Modifications to Cold Creek to enhance trout habitat cannot be justified. The value of this stream as trout habitat is limited, and it would receive very low priority for stocking even if the habitat was improved. Increases in the costs of manpower, gasoline, and trout production make planting of trout into this marginal habitat unjustifiable.

The streamside vegetation along Willow Creek should be protected. This vegetation provides cover for fish and prevents the sun from warming the coldwater stream. The vegetation also provides habitat for birds and small mammals.

Conflicts: Human use has caused the major negative impacts at Cold Creek and Willow Creek, including the greatest destruction of streamside vegetation.

*** Opportunity: Streamside vegetation along Willow Creek could be improved by moving and keeping campsites and other recreation developments away from the streams. An HMP should be developed for the Cold Creek/Willow Creek area.

(b) Nongame Fish--Endangered, Rare, and Threatened Fish

The only nongame fish in the planning unit is the Pahrump killifish, Empetrichthys latos latos Miller. The Pahrump killifish was declared an endangered species in 1967 by the Federal government through publication in the Federal Register, Volume 32 (48):4001, March 11, 1967. It was classified an endangered species by the Nevada Department of Wildlife under NRS, July 1, 1969. It was classified a sensitive species cooperatively between the Nevada Department of Wildlife and the Nevada BLM State Director in April, 1978, in accordance with the procedure and guidelines established in BLM Manual 6840.32.

This fish has also been classified endangered by the Endangered Species Committee of the American Fisheries Society (Deacon et al. 1979). A recovery plan has been drafted for the killifish, but since none of the fish's habitat occurs on public land within the Las Vegas District, BLM has no major involvement in the plan.

The Pahrump killifish occurred originally only in Manse Spring on the Manse Ranch, Pahrump Valley, Nye County, Nevada. This spring no longer exists. The fish now exists only in transplanted populations in the following two locations (see the Aquatic Species Overlay).

- a. Corn Creek Springs Pond, Clark County, Nevada, on the Desert National Wildlife Range, approximately 25 miles northwest of Las Vegas, Nevada. Location T.17S., R.59E., NE1/4 Sec.34.
- b. Shoshone Ponds, White Pine County, Nevada, on BLM administered land about 40 miles southeast of Ely, Nevada. Location T.12N., R.67E., NE1/4 Sec. 2.

2. Molluscs

The Red Rock Fontelicella (Fontelicella n.sp.) is found on submergent vegetation in a spring downstream from Hidden Lakes runoff in the Red Rock Canyon Recreation Lands, Clark County, Nevada. This snail is endemic to one small spring. The species is found rarely (less than 1/cm²) on submergent vegetation in spring run for about 20 meters. It is restricted to specific areas where the water current and vegetation types are conducive to the animal (Landye 1973).

*** Opportunity: The habitat of this species should be protected and annual or semiannual monitoring of the population should be established.

References Aquatic Species

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- Cross, J. N. "Status of the Native Fauna of the Moapa River (Clark County, Nevada)." Transactions of the American Fisheries Society. Vol. 105, No. 4, pp.503-508, 1976.
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NEVADA STREAM EVALUATION CRITERIA MATRIX.

County Clark Stream Muddy River State Code 1487 Stream Length 3 miles
 Reach: From Spring sources (Township 14 S. Range 65 E.) To White Narrows
 Overall Rating: I Hydrographic Region 13

Aquatic Habitat Value Classification	I. Critical	II. High Priority	III. Substantial	IV. Limited	<u>2/</u> Comments
1. Status of endangered species	X				Species 39 Only remaining habitat for existence.
2. Status of threatened species		X			Species 35 Present in reduced numbers
3. Importance for species of high interest				X	
<u>1/</u> 4. Restoration/reclamation/mitigation potential		X			Improve conditions or create refuge for species 39.

1/ No classification will be made on the basis of Criterion 4 alone.

2/ Excellent, good, fair and poor are indicated by E.G.F. & P respectively. The common names for fish species are provided for the number(s) used in the "Comments" in Table .46-47.

TABLE :46- 48
Virgin Valley Planning Unit

NEVADA STREAM EVALUATION CRITERIA MATRIX

County Clark Stream Muddy River State Code 1487 Stream Length _____

Reach: From White Narrows (Township 14 S. Range 65 E.) To Lake Mead

Overall Rating: I Hydrographic Region 13

Aquatic Habitat Value Classification	I. Critical	II. High Priority	III. Substantial	IV. Limited	^{2/} Comments
1. Status of endangered species				X	
2. Status of threatened species	X				Species 37 Limited population Apparently distinctive
3. Importance for species of high interest		X			Species 15, 25, and 28 Water quality P Reproduction F
^{1/} 4. Restoration/reclamation/mitigation potential					

^{1/} No classification will be made on the basis of Criterion 4 alone.

^{2/} Excellent, good, fair and poor are indicated by E.G.F. & P respectively. The common names for fish species are provided for the number(s) used in the "Comments" in Table .46-47.

TABLE .46-48 continued)
Virgin Valley Planning Unit

NEVADA STREAM EVALUATION CRITERIA MATRIX

County Clark Stream Virgin River State Code ? Stream Length 10 miles

Reach: From Arizona Line (Township 13 S. Range 71 E.) To Riverside Bridge

Overall Rating: I Hydrographic Region 13

Aquatic Habitat Value Classification	I.	II.	III.	IV.	
Criteria	Critical	High Priority	Substantial	Limited	<u>2/</u> Comments
1. Status of endangered species	X				Species 31 The only Nevada habitat for the species
2. Status of threatened species				X	
3. Importance for species of high interest				X	Species 25
4. <u>/1</u> Restoration/reclamation/mitigation potential				X	Defined critical habitat

/1 No classification will be made on the basis of Criterion 4 alone.

2/ Excellent, good, fair and poor are indicated by E.G.F. & P respectively. The common names for fish species are provided for the number(s) used in the "Comments" in Table .46-47.

TABLE .46-49
Virgin Valley Planning Unit

APR 15 1981

NEVADA STREAM EVALUATION CRITERIA MATRIX

County Clark Stream Virgin River State Code ? Stream Length 14 miles

Reach: From Riverside Bridge (Township 14 S. Range 69 E.) To Lake Mead

Overall Rating: III Hydrographic Region 13

Aquatic Habitat Value Classification	I. Critical	II. High Priority	III. Substantial	IV. Limited	<u>2/</u> Comments
1. Status of endangered species				X	
2. Status of threatened species				X	
3. Importance for species of high interest			X		Species 18 and 25 Reproduction G
<u>/1</u> 4. Restoration/reclamation/mitigation potential					

/1 No classification will be made on the basis of Criterion 4 alone.

2/ Excellent, good, fair and poor are indicated by E.G.F. & P respectively. The common names for fish species are provided for the number(s) used in the "Comments" in Table .46-4/.

TABLE .46-4/ (continued)
Virgin Valley Planning Unit

NEVADA STREAM EVALUATION CRITERIA MATRIX.

County Clark Stream Cold Creek State Code 1080 Stream Length .2 mile

Reach: From Source (Township 18 S. Range 55 E.) To Diversion

Overall Rating: IV Hydrographic Region 13

Aquatic Habitat Value Classification	I.	II.	III.	IV.	
Criteria	Critical	High Priority	Substantial	Limited	^{2/} Comments
1. Status of endangered species				X	
2. Status of threatened species				X	
3. Importance for species of high interest				X	Species 6 Reproduction P Accessibility P
^{1/} 4. Restoration/reclamation/mitigation potential			X		Minimum flow. Stream Quality P

^{1/} No classification will be made on the basis of Criterion 4 alone.

^{2/} Excellent, good, fair and poor are indicated by E.G.F. & P respectively. The common names for fish species are provided for the number(s) used in the "Comments" in Table .46-47.

TABLE .46-50
Stateline Planning Unit

APR 15 1981 183

NEVADA STREAM EVALUATION CRITERIA MATRIX

County Clark Stream Willow Creek State Code 1463 Stream Length .5 miles
 Reach: From Source (Township 18 S. Range 55 E.) To end
 Overall Rating: I Hydrographic Region 10

Aquatic Habitat Value Classification	I. Critical	II. High Priority	III. Substantial	IV. Limited	^{2/} Comments
1. Status of endangered species				X	
2. Status of threatened species				X	
3. Importance for species of high interest	X				Species 6 Intensive use area Self sustaining population.
^{1/} 4. Restoration/reclamation/mitigation potential				X	This constitutes the only small stream trout fishery in Clark County.

^{1/} No classification will be made on the basis of Criterion 4 alone.

^{2/} Excellent, good, fair and poor are indicated by E.G.F. & P respectively. The common names for fish species are provided for the number(s) used in the "Comments" in Table .46-47.

TABLE .46-51
Stateline Planning Unit

APR 15 1981 184

U.S. FISH & WILDLIFE SERVICE

SPECIES CODE LIST *

1. Lahontan cutthroat trout
2. Mt. Wheeler cutthroat
3. Yellowstone cutthroat
4. Red-banded trout
5. Golden trout
6. Rainbow trout
7. Brown trout
8. Brook trout
9. Dolly Varden trout
10. Rainbow-cutthroat hybrid
11. Lake trout
12. Kokanee salmon
13. Mountain whitefish
14. Grayling
15. Largemouth black bass
16. Smallmouth black bass
17. White bass
18. Striped bass
19. White crappie
20. Black crappie
21. Bluegill sunfish
22. Sacramento perch
23. Walleye
24. Northern pike
25. Channel catfish
26. White catfish
27. Brown bullhead
28. Black bullhead
29. Cui-ui
30. Humpback sucker
31. Woundfin
32. Virgin River spinedace
33. White River spinedace
34. White River sucker
35. White River springfish
36. Railroad Valley springfish
37. Colorado River bonytail
38. Pahrnagat bonytail chub
39. Moapa dace
40. Threadfin shad
41. Nevada pupfish
42. Devils Hole pupfish
43. Pahrump killifish
44. Soldiers Meadows dace

*Only species which are of some significance and
are found in lotic habitats,

TABLE .46-53
Clark County

USFWS STREAM CLASS DEFINITIONS

<u>Overall Rating</u>	<u>Rating Definitions</u>
I	Highest-Valued Fishery Resource
II	Highest-Priority Fishery Resource
III	Substantial Fishery Resource
IV	Limited Fishery Resource
V	Unsurveyed Stream Reach

TABLE .46-54
Virgin Valley Planning Unit

DISTRIBUTION OF FISHES

<u>Species</u>	<u>Moapa River</u>	<u>Virgin River</u>
Asiatic Carp-- <u>Cyprinus carpio</u> *	X	X
Black Bullhead-- <u>Ictalurus melas</u> *	X	
Bluegill-- <u>Lepomis macrochirus</u> *		X
Channel Catfish-- <u>Ictalurus punctatus</u> *	X	X
Desert Sucker-- <u>Pantosteus clarki</u>		X
Fathead Minnow-- <u>Pimephales promelas</u> *	X	
Flannelmouth Sucker-- <u>Catostomus laticornis</u>		X
Golden Shiner-- <u>Notemigonus crysoleucas</u> *	X	
Green Sunfish-- <u>Chaenobryttus cyanellus</u> *	X	X
Largemouth Bass-- <u>Micropterus salmoides</u> *	X	X
Mexican Molly-- <u>Poecilia mexicana</u> *	X	
Moapa Dace-- <u>Moapa coriacea</u> (abce)	X	
Moapa River Roundtail-- <u>Gila robusta</u> spp	X	
Moapa River Speckled Dace-- <u>Rhinichthys osculus moapae</u> (d)	X	
Moapa White River Springfish-- <u>Chrenichthys baileyi moapae</u> (be)	X	
Mosquito Fish-- <u>Gambusia affinis</u> *	X	X
Rainbow Trout-- <u>Salmo gairdneri</u> *	X	
Red Shiner-- <u>Notropis lutrensis</u> *	X	X
Virgin River Roundtail Chub-- <u>Gila robusta seminuda</u> (c)		X
Virgin River Speckled Dace-- <u>Rhinichthys osculus yarrowi</u>		X
Woundfin-- <u>Plagopterus argentissimus</u> (abce)		X

*--Introduced.

a--Classified endangered by the U.S. Fish and Wildlife Service

b--Classified rare by Nevada Department of Wildlife.

c--Classified endangered by the American Fisheries Society (AFS) Endangered Species Committee.

d--Classified threatened by the American Fisheries Society (AFS) Endangered Species Committee.

e--Classified sensitive cooperatively by BLM and Nevada Department of Wildlife.

TABLE .46-55
Virgin Valley Planning Unit

ENDANGERED, RARE, AND THREATENED FISH

Species	Federal Classification	State of Nevada Classification*1	BLM/NDW*2 Classification	AFS *3 Classification
Moapa Dace	Endangered/March 11, 1967,/Federal Register, /Volume 32, Page 4001	Rare March 6, 1978	Sensitive April, 1978	Endangered
Moapa River Speckled Dace	_____	_____		Threatened
Moapa White River Springfish	_____	Rare March 6, 1978	Sensitive April, 1978	_____
Virgin River Roundtail	_____	_____	_____	Endangered
Woundfin	Endangered/October 13, 1970/Federal Register, Volume 35, Page 16047	Rare March 6, 1978	Sensitive April, 1978	Endangered

*1 Under the State of Nevada Board of Fish and Game Commissioners General Regulation No. 1 (8) which was ordered under the authority of Nevada Revised Statutes 501.110.

*2 Sensitive Species are classified cooperatively between the Nevada BLM State Director and the Nevada Department of Wildlife, in accordance with procedures and guidelines established in BLM Manual 6840.32.

*3 Classifications made by the Endangered Species Committee of the American Fisheries Society (AFS), a professional society of fisheries biologists. See Deacon et al. 1979.

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.47A Recreation

Overlays

Eleven overlays have been prepared for Clark County (six for the Stateline Planning Unit and five for the Virgin Valley Planning Unit), showing quality evaluation areas for the following activities.

Off-Road Vehicles

Sightseeing - Geological, Botanical, Zoological

Sightseeing - Historical, Archeological

Hunting

Collecting

Hang Gliding and Rock Climbing (Stateline only)

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A. Introduction

Recreation is the focal point of many Nevadans' lives. Many shape their lifestyles around their recreational pursuits. The Governor's Commission on the Future of Nevada surveyed state residents in early 1980 to determine their concerns. Results of the studies are remarkable:

--"For most Nevadans, our state is defined by its vast open spaces and the recreational opportunities that go with them" (Governor's Commission 1980 Page A).

--When asked what changes in their lifestyle they would accept, "...Nevadans would least accept loss of access to the out-of-doors" (Governor's Commission 1980 Page A).

--Of ten categories of economic development which could expand in Nevada, recreation ranked second as the one residents would most like to see expanded.

Bringing this closer to home, the primarily urban population of Clark County, which accounts for close to 60 percent of Nevadans, has special recreational needs. "...Clark County has grown extremely rapidly in the past 30 years." The 1977 Statewide Comprehensive Outdoor Recreation Plan (SCORP)"...has documented Clark County as an area where demand for recreation facilities far exceeds supply. Summer campsites and day-use areas with shade and water are in high demand. Interpretive facilities are very limited, yet many opportunities exist" (CCDPR 1980, p.34).

Other natural resources agencies in Clark County are suffering from overuse of their recreation areas. The Toiyabe National Forest reports that use has exceeded 300 percent of the capacity of existing facilities on peak weekends. Local State Parks and Lake Mead National Recreation Area are experiencing similar problems. In fact, at a time when demand for camping is increasing markedly, both the U.S. Forest Service and National Park Service are converting campgrounds into picnic sites to accommodate the ever-more popular day-use activities.

Adding to this shortage, as the price of gas skyrockets, Clark County residents are and will be increasingly looking to local areas to satisfy their recreational needs.

All of these factors point to BLM's responsibility to provide additional recreation opportunities in Clark County. Along with the commission to manage the majority of the open space in the county, BLM must take a more active role in meeting the county's recreation demand.

It is important to consider not only the needs of the Las Vegas metropolitan area, but also of the outlying communities. As these communities grow, there will be a need for setting land aside for recreational purposes. The area's intensive recreation activities, such as swimming pools and recreation centers, can be met through R&PP leases. Although natural resources recreation activities may require developed facilities like horse trails, often all that is required is setting aside open space and access to it.

*** In addition to providing new opportunities, it is important to insure that existing opportunities are retained. Potential visual impacts of oil and gas operations and utility corridors, for example, should be mitigated wherever possible to preserve sightseeing resources. According to the findings of the Governor's Commission on the Future of Nevada, one of the most valuable resources BLM can provide recreationists is access to the public lands. Elements that restrict this access, such as tramroad rights-of-way and "No Trespassing" signs on mining claims, should be kept to a minimum. By limiting public use of

the Johns-Manville Road (a tramroad right-of-way), Pabco Gypsum is hampering ORV use in the Las Vegas Dunes, and hiking, rockhounding, and sightseeing in the foothills of the Muddy Mountains. Table .47-1 describes the condition of access to all the recreation areas mentioned in this Recreation URA.

TABLE .47-1
Clark County
ACCESS TO RECREATION AREAS

VIRGIN VALLEY

<u>Recreation Area</u>	<u>Description of Access</u>
Arrow Canyon	Via a graded unsurfaced road off State Route 7
Arrow Canyon Range	Via U.S. Highway 93
Bunkerville	Via a paved road off I-15
Dry Lake Valley	Via I-15
East Las Vegas	Via varying quality unsurfaced roads off Lake Mead Blvd. or Boulder Highway
Flat Top Mesa	Via a graded unsurfaced road off I-15
Gold Butte	Via numerous graded rough unsurfaced roads which connect with the graded unsurfaced Gold Butte road
Devil's Throat	Via a graded unsurfaced road off the Gold Butte road
Mud Hills	Via a rough unsurfaced road off the St. Thomas Gap road
Paradise Valley	Via a rough unsurfaced road off the Gold Butte road
Red Bluffs	Via a 4-wheel drive road off the Gold Butte road
Whitney Pockets	Via the paved New Gold Butte road
Las Vegas Range	Via rough unsurfaced roads not recommended for sedans off U.S. Highway 93
Meadow Valley Wash	Via the graded unsurfaced Meadow Valley Wash road
Moapa Valley	Via State Route 7 and State Route 12
Overton Corridor	Via State Route 12
Overton Ridge	Via an unsurfaced road off State Route 12
Warm Springs Palms	Via a paved road off State Route 7
Mormon Foothills	Via graded unsurfaced roads off I-15
Mormon Mesa	Via graded unsurfaced roads off I-15
Muddy Mountains	Via State Route 40 or the rough unsurfaced American Borax Road, not passable by sedan
Anniversary Mine Area/ West End Wash	Via a rough unsurfaced road off North Shore Drive or the West End Wash Road which requires 4-wheel drive at certain time of the year
Buffington Pockets	Via rough unsurfaced American Borax Road, not passable by sedan
Foothills of the Muddy Mountains	Access is limited by lack of roads; West End Wash Road requires 4-wheel drive at certain times of the year
North Muddy Mtns.	Via a graded unsurfaced road off I-15 or on a unsurfaced road through a private ranch near Glendale
Weiser Bowl	Via rough unsurfaced road which may require 4-wheel drive
South Virgin Mtns.	Via a graded unsurfaced road which connects with the paved New Gold Butte road
Virgin Mtns. (Natural Area)	Via numerous graded unsurfaced and 4-wheel drive roads off the paved New Gold Butte road
Virgin River (Recreation Lands)	Via rough unsurfaced roads off the paved New Gold Butte road

TABLE .47-1 (continued)
Clark County
ACCESS TO RECREATION AREAS

STATELINE

<u>Recreation Area</u>	<u>Description of Access</u>
Bird Spring Range	Via rough unsurfaced roads which junction with State Route 16
Castle Mountains	Via graded unsurfaced roads
Cottonwood Cholla Area	Via State Route 68
Crescent Peak	Via graded unsurfaced roads off State Route 68
Dead Mountains	Via graded unsurfaced roads
Eldorado Mountains	Via State Route 60 off U.S. Highway 95
Eldorado Canyon/Nelson	Via State Route 60
Gregory's Arch	3/4 mile hike from State Route 60
Keyhole Canyon	Via rough unsurfaced roads off U.S. Highway 95
Eldorado Valley	Via U.S. Highway 95
Frenchman Mountain	Via Lake Mead Blvd.
Goodsprings Area	Via State Route 53
Highland Range	Via unsurfaced, road passable by sedan, off of U.S. Highway 95
Jean/Ivanpah Valley	Via I-15
Las Vegas Dunes	Via the Old Salt Lake Highway (paved) or the Johns-Manville road, a paved private road with limited public access
Las Vegas Wash	Via numerous graded unsurfaced and paved roads off Boulder Highway
Lava Butte	Via rough unsurfaced roads off of either Lake Mead Drive or Lake Mead Blvd.
McCullough Mtns. -North	Via unsurfaced roads, both 4-wheel drive and graded, that junction with U.S. Highway 95 and I-15
McCullough Mtns. -South	Via unsurfaced roads, both 4-wheel drive and graded, that junction with State Highway 68
Mohave Trail	Via graded unsurfaced roads
Newberry Mtns.	Via graded unsurfaced roads off U.S. Highway 95
Christmas Tree Pass	A graded unsurfaced road
Pahrump/Sandy Valley	Via State Route 16
Piute Valley	Via U.S. Highway 95
Joshua Tree Forest	Via State Route 68
Rainbow Gardens	Via both paved and unsurfaced roads off Boulder Highway
River Mountains	Via graded unsurfaced roads off Boulder Highway
Searchlight	Via U.S. Highway 95
Sloan Butte	Via a graded unsurfaced road from Sloan; public use of road is sometimes restricted by right-of-way holder
Spring Mountain	Via numerous graded unsurfaced roads off State Route 16 in the south and U.S. Highway 95 in the north
Clark Canyon	Via the graded unsurfaced Clark Canyon road off the Wheeler Pass Road

TABLE .47-1 (continued)
Clark County
ACCESS TO RECREATION AREAS

STATELINE

<u>Recreation Area</u>	<u>Description of Access</u>
Cold Creek/Willow Creek Area	Via a paved road off U.S. Highway 95
Cold Creek	Via a graded unsurfaced road 1/2 mile from guard station
Cold Creek Guard Station	Via a paved road off U.S. Highway 95
Willow Creek	Via a graded unsurfaced road a few miles from Cold Creek Turnoff
Kyle Canyon	Via State Route 39 off U.S. Highway 95
Lee Canyon/Desert View Natural Area	Via State Route 52 off U.S. Highway 95
Lovell Canyon	Via the graded unsurfaced Lovell Canyon road off State Route 16
Mount Potosi/ Potosi Mine	Via graded unsurfaced road off State Route 16
Potosi Barrel Cactus Area	Via graded unsurfaced road off Wilson Pass road which is a graded unsurfaced road
Red Rock Canyon Recreation Lands	Via West Charleston Blvd
Brownstone Canyon	Via rough unsurfaced road off West Charleston Blvd
Calico Hills	Via the Scenic Loop Drive off West Charleston Blvd
LaMadre Mountain	Via unsurfaced 4-wheel drive roads off West Charleston Blvd.
Oak Creek Canyon	Via the Scenic Loop Drive off West Charleston Blvd
Pine Creek Canyon (Natural Area)	Via the Scenic Loop Drive off West Charleston Blvd
Red Rock Escarpment	Via the Scenic Loop Drive off West Charleston Blvd
Red Springs	Via Calico Basin road (paved) off West Charleston Blvd; turnoff road unsurfaced, but passable by sedan
Sandstone Quarry	Via the Scenic Loop Drive off West Charleston Blvd; actual entrance road is unsurfaced and rough, though passable by sedan
The Caves	Via rough unsurfaced road passable by sedan off West Charleston Blvd
Willow Spring	Via the Scenic Loop Drive off West Charleston Blvd.
Trout Canyon	Via the graded unsurfaced Trout Canyon road off State Route 16
Wheeler Wash/Wheeler Charcoal Kilns	Via the graded unsurfaced Wheeler Pass road off State Route 16
Sunrise Mountain Natural Area	Via Lake Mead Blvd

B. Recreation Sites

1. Bureau of Land Management

Developed Recreation Sites: The only developed recreation sites in Clark County are in the Stateline Planning Unit.

Cold Creek/Willow Creek: This area is north and east of the adjacent Toiyabe National Forest. Situated at the 6,000 feet elevation, the area contains two perennial streams: Cold Creek and Willow Creek. The vegetation consists of pinyon-juniper, blackbrush, joshua tree, and other higher elevation desert shrubs.

There are definite user conflicts in this area. There are over 200 acres of private land which abut the Cold Creek campground area on the northern and eastern sides. The land owner is currently developing this land (subdividing into 193 .5- to 1.5-acre lots, with roads, water system, etc.) for selling as individual home sites. Any development of Cold Creek or the guard station could cause serious conflicts.

The road between Cold Creek and Willow Creek crosses several private holdings. Because this is the only vehicular access to Willow Creek, there could be future problems maintaining public access to this popular recreation area.

Use conflicts between recreationists also occur. Motorcycle gangs frequent the area and have in the past taken control of the Cold Creek campground. Indiscriminate ORV use, woodcutting trespassers, and man-caused fires are causing environmental damage.

*** A more intensive management of Cold Creek/Willow Creek could improve camping, hiking, and other recreation opportunities while protecting the natural resources. The partially-completed Cold Creek/Wheeler Wash Recreation Management Plan (RMP) could be upgraded and completed as a Recreation Area Management Plan (RAMP). The plan could be coordinated with the Forest Service and Clark County (which owns the eastern extent of the Cold Creek Guard Station area).

The Cold Creek Guard Station was formerly within the Desert National Wildlife Range and the remains of buildings are located where the U.S. Fish and Wildlife Service patrol

headquarters were located. There is a small grassy field and a canal which normally contains water. This canal feeds a series of small ponds (on Clark County land) a short distance downhill to the northeast of the guard station. Facilities are limited to a shelter, a few trash cans, a fireplace, and picnic tables.

The Cold Creek campground is situated in a small hollow approximately 1/4 mile below the Cold Creek spring. The Cold Creek stream flows past the campground which has a capacity for six family groups. Facilities consist of picnic tables and trash cans.

The Willow Creek campground is much larger than the one at Cold Creek. Willow Creek offers about 25 semi-isolated campsites, some with picnic tables and charcoal fire grills.

Red Rock Canyon Recreation Lands (RRCRL): The RRCRL are located on the eastern slopes of the Spring Mountains with elevation ranging from 3,500 to 8,000 feet. The predominant topographic feature is the 3,000-foot sandstone escarpment that extends north and south through Red Rock Canyon. Steep box canyons occur along the length of the escarpment. The area also supports impressively diversified flora and fauna. The RRCRL contain the highest concentration of recreation opportunities in the Las Vegas District. They range from those commonly associated with an urban park, such as sightseeing and picnicking along the Scenic Loop Drive, to wilderness experiences like backpacking and rock climbing. The proximity of these lands to the population center of Las Vegas further amplifies their recreation value.

Following is a description of the main recreation sites in the RRCRL and what each currently offers.

Brownstone Canyon: Brownstone Canyon is a remote colorful canyon with extensive archeological values. Protection of archeological sites and assured public access over private lands are the major problems facing the area.

Calico Hills: This area contains highly colored remnants of Aztec Sandstone that can be seen from most areas of the RRCRL. Interpretive signs and trails are planned throughout the area. Red Springs contains 6 tables, 15 undeveloped sites, grassy playing fields, and can accommodate groups of up to 150. Sandstone Quarry has a few tables and numerous undeveloped sites.

Willow Springs: This area (including Lost Creek, Lone Pine Springs, and La Madre Springs) is a canyon that has become a major visitor use area, as well as the gateway to the Red Rock high country. Willow Spring offers 17 picnic tables, barbeque grills, and toilets. Vandalism is a problem at Willow Spring and at Lost Creek. Better patrolling is needed in the area. A night closure of the Scenic Loop Drive to protect the resources is being considered. The poor condition of the Rocky Gap Road causes many vehicle problems. Picnic facilities at Lone Pine Spring and group camping facilities at La Madre Spring are planned.

Pine Creek: Pine Creek is the largest watershed in the RRCRL. Aside from its scenic qualities, the area is also a research natural area (720 acres) for its unique botanical qualities.

The Caves: The Caves are famous for a multiple-layer limestone cavern which originally possessed stalagmites and stalactites. The area receives extensive visitor misuse. Vandalism has totally destroyed the geological features. This place is a gathering spot for disruptive youths and illegal drug and beer parties.

Oak Creek Canyon: Oak Creek Canyon is one of the broader canyons in the RRCRL. Access is by a very rough dirt road. The area is managed as a primitive camping zone and plans call for improvement of the road and development of overnight facilities.

Other Canyons: (Including First Creek, Ice Box Canyon, Sandstone Creek, Velvet Canyon, and the canyons above Mud Springs) These canyons are all noted for their outstanding scenery (VRM Class A) and extremely rugged terrain. Access to the canyon mouths can be provided by trails but further exploration can only be done by experienced hikers and technical rock climbers.

Visitor Center: This will be the administrative and interpretive center and will introduce visitors to the opportunities available in the RRCRL. It will provide exhibits, literature, maps, information, and interpretive programs. Interpretive and environmental education programs for local schools, organized groups, and the general public will be a major function of the visitor center, scheduled to be open to the public in the summer of 1981.

Possibilities for interpretation and environmental education away from the visitor center are limitless. They range from automobile and bus tours on the paved roads, to easy walks on fairly level terrain, to a wilderness backpacking experience of several days duration. University classes, continuing education classes, school groups, scouts, and others value Red Rock Canyon as a living laboratory. In recent years the BLM has conducted numerous interpretive talks and environmental education programs in response to direct requests from such groups. In 1980, eight to ten talks and tours were given to such diverse groups as the 4-H, Boy Scouts, and school groups.

In addition to those already mentioned, the following use conflicts plague the RRCRL.

- wrong way travel on a one-way road
- excessive vehicle speed
- traffic accidents, including several fatalities
- climbing accidents, including several fatalities
- acts of violence against other people
- unrestricted open campfires
- man-caused wildfires
- vandalism of improvements, archeological sites, and natural resources
- unauthorized off-road vehicle use
- illegal camping
- public confusion between the management philosophies of BLM and Nevada Division of State Parks

In short, Red Rock Canyon is suffering from many problems normally associated with an urban park. The area requires more intensive management to protect the natural resources and upgrade the recreational experiences of visitors.

The Red Rock Canyon Recreation Lands (RRCRL) comprise about 60,000 acres of range land in the middle of the Spring Mountain allotment. Livestock grazing, while it could add a pastoral element to the RRCRL, would more likely clash dramatically with recreation use. The key recreational facilities would be related to water as is the Willow Spring Picnic Area. Livestock would also be attracted there. Fencing, water developments, pipelines, and other livestock facilities would detract from the visual experience. Because of the high visitor volume, confrontations between visitors and livestock would no doubt escalate rapidly, to

the annoyance of both recreationist and operator. Danger on the Scenic Loop Road and the Blue Diamond Road would be increased by the possibility of collisions between vehicles and livestock.

*** Opportunities

Opportunities for enhancement in the RRCRL are many.

- Develop management plans for the various use area
- Implement the recommended recreation maintenance program
- Implement the interpretive and environmental education programs, both on- and off-site
- Implement the Master Plan (the major elements of which have been discussed in the description of the major recreation sites in the RRCRL), updating it every second year or as needed (see Management Areas - BLM-RRCRL for details on the Master Plan)
- Provide professional emergency services for visitor safety
- Provide visitor and resource protection with on-site law enforcement services
- Develop and adopt a set of comprehensive use regulations

The opportunity exists to close the Red Rock Canyon Recreation Lands to livestock grazing to protect the recreation values identified and managed for. Closure should be accomplished through a Federal Register notice.

Dispersed Recreation Sites: Dispersed recreation sites are those sites established by visitors rather than by the planning and design of managers. Dispersed camping on roaded BLM land takes place in numerous areas.

The Las Vegas District is currently using the Code-a-Site program to identify and classify these sites. The initial phase in Clark County, which has identified approximately 50 percent of the dispersed sites, has revealed several facts.

Almost every road on public land in Clark County has some recreation sites. Sites are generally located near the road and in an area that affords some space for parking a vehicle. Certain environments, such as mountainous areas with trees (high elevation) and good access, tend to have more sites than those lower elevation areas associated with the creosote and low desert shrub community.

The Spring Mountains have the highest concentration of sites. Sites are located along the many canyon and spur roads, and are prevalent near springs. There are also many sites in the McCullough, Muddy, and Virgin Mountains. The size of the site is determined more by terrain features than by any other factor.

Use conflicts can and do arise from the establishment of these sites. Some of these conflicts are fire rings in hazardous places; negative impacts to the vegetation and soil; use of spring water that is, in most cases, unsafe for human consumption; and use of sites near springs, which can cause animals dependent on the water to vacate the area.

*** A complete inventory of dispersed recreation sites within Clark County could allow more effective management of these important recreation areas.

*** Certain sites may warrant improvement, such as installing trash cans or barrier posts to limit size of site. Other sites may warrant closure due to severe impacts on the vegetation, soil, or terrain, or because of hazards. The relatively intensively used sites in the Spring Mountains could benefit from these two examples of intensive management. Areas of site concentrations in all of the mountain ranges could benefit from patrols to provide visitor information and assistance and to monitor resources.

2. U.S. Forest Service

The Las Vegas Ranger District in the Spring Mountains is the southernmost district of the Toiyabe National Forest and is located approximately 35 miles northwest of Las Vegas, Nevada. This district contains numerous camping and picnicking areas within its 62,000 acres. The east slopes are the most accessible and popular.

The district also offers developed hiking trails, the concessionaire-operated Lee Canyon downhill ski area (which has a ski lift and a lodge), and the developed Lee Canyon snow play area, with designated hills and restrooms.

There is currently more demand for facilities on the weekends than can be accommodated. Heavy use has led to site deterioration. The Forest Service is working on development of new sites adjacent to BLM areas between the Lee Canyon Road and Willow Creek, and an opportunity exists to coordinate planning efforts with the BLM for development of recreation areas bordering the National Forest.

There are 3 camping and picnicking areas along the Kyle Canyon Road, containing a total of 34 units for family camping, 75 units for family picnicking, and 27 units for group picnicking. Together these areas can accommodate 680 people at one time. The Forest Service has also developed an overflow area along this road to accommodate self-contained mobile units. Reservations and fees are required for this area.

There are 4 camping and picnicking areas along the Lee Canyon Road, containing a total of 62 units for family camping, 61 units for family picnicking, and 146 units for group picnicking. Together these areas can accommodate 1,345 people at one time. The Forest Service has also developed an overflow area along this road to accommodate self-contained mobile units. Reservations and fees are required.

There are 3 camping and picnicking areas along the Deer Creek Highway, containing a total of 36 units for family camping, 11 units for family picnicking, and 48 units for group picnicking. Together these areas can accommodate 475 people at one time.

3. National Park Service

Lake Mead National Recreation Area (NRA) is centered along a 182-mile stretch of the Colorado River which is the boundary between Nevada and Arizona. This 1.5 million acre National Park Service (NPS) management unit is located 30 miles east of the Las Vegas metropolitan area. Elevation ranges from 517 feet above sea level below Davis Dam to 7,072 feet on the Shivwits Plateau.

The focal point of this NRA is Hoover Dam and its reservoir, Lake Mead. Hoover Dam is the highest dam in the western hemisphere. Lake Mead is one of the largest artificial lakes in the world. Davis Dam and Lake Mohave are also within the NRA.

In addition to these vast water resources, Lake Mead NRA's attributes include the rugged scenery of such places as Black Canyon and Iceberg Canyon, the southern entrance to the Grand Canyon, the spectacular temple at Temple Bar, the trees and colder climate of the Shivwits Plateau, and the volcanic/sedimentary layered formation of Fortification Hill.

There are numerous washes and dirt roads leading north from the Northshore Drive into the Gale Hills and the foothills of the Muddy Mountains. The area is rugged and remote, yet is frequently used in the cool weather months by NPS-sponsored hiking groups, gem collectors, and other recreationists. In most cases, the groups quickly cross the NPS boundary and spend most of their time on the adjacent BLM administered lands.

Lake Mead NRA offers an extensive network of developed recreation facilities. There are twelve family campgrounds with a total of 1,334 sites and a capacity of approximately 9,530 people. One group campground can accommodate an additional 160 people. There is also one designated primitive campground at Overton Beach.

Eight picnic grounds with 143 sites can serve approximately 1,150 visitors. Eleven paved boat launching ramps and seven designated swimming beaches facilitate water sports.

Public information and interpretive services are offered at the Alan Bible Visitor Center and three developed amphitheaters. These amphitheaters have a seating capacity of 750 people.

Concessionaires also provide many recreation opportunities within the NRA. These include:

- 234 motel/hotel rooms with an 802-person capacity
- Snack bars and restaurants with a 1,056 to 1,106-person capacity
- 1,166 trailer sites
- marinas with 2,699 boat slips

A few use conflicts occur where BLM lands abut the Lake Mead NRA. ORVs are the main problem. NPS restricts vehicular travel to designated roads, trails, and washes. On much of the adjacent public land BLM allows unrestricted off-road driving. This problem occurs primarily where the boundary is not easily identifiable by fencelines, signs, mountain ranges, or other natural barriers. An opportunity exists to coordinate vehicular use plans and patrol efforts in these areas.

4. U.S. Fish and Wildlife Service

The Desert National Wildlife Range (DNWR) contains more than 1.5 million acres and is a wildlife refuge managed by the U.S. Fish and Wildlife Service (USFWS). The DNWR is located 25 miles north of Las Vegas, Nevada.

There are two main roads that are open to public use. All the roads in the refuge are primitive unsurfaced roads and ordinary passenger vehicles are not recommended for travel in the area. Both of the main roads traverse the area and eventually empty onto U.S. Highway 93.

The refuge is open from 5:00 a.m. to 9:00 p.m. daily. Camping and backpacking are permitted only on a reservation and permit basis. There are no developed recreation sites on the refuge.

Refer to the Zoological Sightseeing section.

5. Nevada Division of State Parks

According to the Nevada State Park Guide and Nevada Division of State Parks (NDSP) officials, the following recreation information applies to the three state parks located within Clark County.

Stateline Planning Unit

Spring Mountain Ranch State Park: The 528-acre park is located within the Red Rock Canyon Recreation Lands (RRCRL) and is managed as a unit of the Nevada State Park system. The park offers 25 units for family picnicking, a large group picnic area, hiking and interpretive trails, a visitor center, and grassy playing fields. The picnic facilities can accommodate approximately 275 visitors. The spectacular multi-colored Red Rock escarpment adjacent to the ranch, the lush green fields and trees within the park, and its proximity to the Las Vegas area are its primary attractions.

An 80-acre parcel of NDSP land in Pine Creek contains a hiking trail, a rare ponderosa pine-covered creek, and a historical site.

As per a 1969 cooperative agreement, NDSP manages the recreation resource on 17,000 acres of public land in the northern portion of Red Rock Canyon. This agreement is currently being revised.

NDSP has identified two use problems with adjacent BLM lands: recreational trespassing into closed areas of Spring Mountain Ranch, and the danger of wildfire. The revised management agreement between BLM and NDSP, was signed in early 1981, addresses these problems.

*** Numerous opportunities for coordinating trails and other improvements with NDSP are detailed in the Red Rock Master Plan.

Floyd R. Lamb State Park: Floyd R. Lamb Park (880 acres) is located one mile east of U.S. 95, about eight miles north of the Las Vegas metropolitan area. This park contains 95 units for family picnicking and 2 group picnic areas which all together accommodate approximately 910 visitors. The park offers an urban experience of tree-shaded groves along small lakes and large grassy playing fields. NDSP is studying the possibility of opening the stables of this former dude ranch to the public. This would greatly increase horseback riding

on adjacent BLM lands. The construction of equestrian trails that tie into the stables could be considered.

Virgin Valley Planning Unit

Valley of Fire State Park: Valley of Fire State Park (46,000 acres) is located about 55 miles northeast of Las Vegas. The park offers 80 units for family picnicking and 3 group areas. Together these day-use areas can accommodate approximately 865 people. The 50 units for family camping have a capacity of 350. Hiking and interpretive trails and a visitor center aid in the enjoyment of the main features of the park. These include interesting geological and aboriginal sites.

*** There is an opportunity to construct trails on BLM administered lands and tie these into the existing Valley of Fire trail system.

6. Clark County

Of the Clark County Department of Parks and Recreation management areas, only recreation activities dealing with natural resources will be addressed. These are the proposed Clark County Wetlands Park, and bicycle and equestrian trails.

The Las Vegas Wash is slated to be turned into the Clark County Wetlands Park. "The Las Vegas Wash is an outstanding geographic feature...having substantial biological value and recreational potential. This wetland area supports an extremely abundant fauna and flora unique to the desert region around Las Vegas" (CCDPR 1980, p. 1). Located between the city of Las Vegas and Lake Mead, the Wash is the drainage channel for the Las Vegas Valley.

Land ownership within the Las Vegas Wash area is predominantly private and federal. Federal lands border on the north and east. Access is not readily available to much of the Wash. Several rough dirt roads tie Boulder Highway and Lake Mead Drive to the Las Vegas Wash, and the paved Northshore Road passes over the lower Wash area.

Alternative plans offering three levels of intensity of development have been prepared for the Las Vegas Wash and Rainbow Gardens area (which is BLM administered). A variety of recreational activities would be accommodated. Uses could include equestrian trails, bicycle trails, ORV trails, hunting areas, field games, interpretive centers, and zoological, botanical, geological, and archeological sightseeing.

*** Use conflicts on adjacent public lands are related to ORVs and shooting. These conflicts could be mitigated either by leasing these adjacent lands to Clark County, or by creating a buffer area along the Las Vegas Wash. Within this buffer, ORV use could be limited to designated roads and trails and shooting allowed only where permitted on the adjacent Clark County lands.

*** An important aspect of the Wetlands Park proposal is acquisition of the Rainbow Gardens through an R&PP lease (Forson and Gork, Clark County, personal communication, 1980). The purpose would be to expand the Wash management area and to provide and protect the recreation resource. Frenchman Mountain could also be considered for this regional park, because it borders Rainbow Gardens and offers many similar sightseeing and interpretive values.

*** Clark County has expressed an interest in coordinating the eventual ORV, bicycle, and equestrian trails of the Clark County Wetlands Park with similar trails on adjacent BLM administered lands. There is an opportunity to cooperate with Clark County in developing this park concept.

*** Additional equestrian trail coordination with Clark County could include developing a trailhead in the Sloan Wash area to serve Sunrise Mountain, tying in the Henderson stable area with Horseman's Park, connecting Duck Creek with the Stadium Park, and constructing a trail to Tule Springs and beyond. Clark County, to fulfill a need outlined in the 1977 Nevada SCORP, is extending the West Charleston bicycle path toward Blue Diamond, and encourages construction of a bicycle lane along the Red Rock Scenic Loop Drive.

7. Commercial

There are a variety of commercial recreation establishments in Clark County. This discussion will concentrate on those sites which are located in rural areas and are natural resource related, such as camping areas and riding stables. The following list describes only the major private recreation concessions, and is not meant to be a complete inventory of all Clark County sites.

Stateline Planning Unit

Sky Mountain Ranch: This 160-acre holding is surrounded by public land at the 6,000 foot elevation in the Spring Mountain Range. Until 1980, this valley, with an ephemeral creek among juniper and pine trees, was a camping/picnicking

resort. Existing facilities included two recreation buildings, a swimming pool, a grassy playing field, approximately 60-70 primitive campsites, and 12 picnic tables which can accommodate about 85 people.

Use problems exist with adjacent public lands which attract partiers, shooters, and illegal woodcutters. A July 1979 wildfire, which started from a campfire on nearby public
*** land, threatened Sky Mountain Ranch. More intensive use supervision and patrols in the Lovell and Trout Canyon areas could alleviate at least part of these problems.

New owners of the Sky Mountain Ranch plan a major development of the site in late 1980 (Lynch, personal communication, 1980). Plans include permanent housing, developed and primitive campsites, hiking and riding trails, and a casino bar/restaurant and game room. The owners are attempting to exchange their private parcels of land for public land adjacent to the ranch. The owners would also like to have Lovell Canyon Road paved.

These energetic plans would have major impacts on public lands in the Lovell and Trout Canyon areas. Increased
*** visitation and improved access in the area would necessitate a more intensive management of the public lands. A RAMP could be written to consider such items as recreation facilities, patrols, and the possibility of coordinating recreation activities with those of the proposed development at Sky Mountain Ranch.

Mt. Charleston Riding Stables: This 100-acre site is bounded on the west by the Toiyabe National Forest, on the south and east by BLM, and on the north by the Kyle Canyon Road. Located at about the 6,000-foot elevation among brush and sparse trees at the base of the Spring Mountain Range, this stable offers 15 rental horses for individual and trail guide rides, a small store/snack bar, and two picnic tables. Use is currently year-round, primarily on BLM roads. The new owner has expressed interest in acquiring some adjacent public land (Danes, personal communication, 1980). He is considering limiting his operation to a six-month summer
*** season. There is an opportunity to construct a trail network to tie into the stables.

Bonnie Springs Ranch/Old Nevada: Bonnie Springs/Old Nevada is billed as an old western town set within the scenic Red Rock Canyon area. Surrounded by BLM administered lands, this 115-acre private holding is a favorite stop for RRCRL visitors.

This cool, shaded canyon with its permanent streams supports a large variety of rare and endemic plant species of which many are relicts from an era when the entire region was cool and moist. A large number of fern species, ranging from the common chain fern to the rare Polystichum scopulinum, of which 16 individuals have been identified in Pine Creek, are found here. This is more than occur anywhere else in the Spring Mountains. Another member of the relict community preserved here is the ponderosa pine. At 3,900 feet, this stand has extended into the lower limits of the species' elevation range. The rare mingle with the commonplace desert plant species (such as creosote, blackbrush, oak, willow, hackberry, redbud, pinyon, juniper, and several varieties of cacti), providing a unique and scenic habitat. This habitat supports a varied wildlife community of bobcat, kitfox, antelope ground squirrel, skunk, panamint chipmunk, and desert bighorn sheep. A verified sighting of one lone male peregrine falcon was documented in the spring of 1980.

Archeological resources adjacent to the Natural Area consist of shelter caves, lithic scatters, and agave roasting pits at the canyon's mouth. Recreational opportunities available include hiking, botanical and geological studies, camping, sightseeing, photography, and rock climbing. The hiking trail which has been worn along the streambed displays evidence of moderately heavy visitation impacts, including damaged vegetation, discarded clothing, discarded glass, metal, and paper debris, and water pollutants. This fragile ecosystem could benefit from management more befitting its natural area designation. Underscoring this, in 1975, Red Rock Canyon, Pine Creek included therein, was reviewed and nominated for National Natural Landmark status. A decision will be made by the Heritage Conservation and Recreation Service (HCRS).

*** An opportunity exists to enlarge the Natural Area and afford greater protection to the highly unusual conifers and assortment of desert and mountain plants.

Desert View Natural Environment Area: (Note: This area was designated in 1970 under the preceding name, but is listed in the Department of Interior Directory of Natural Areas (1975) as the Desert View Outstanding Natural Area.)

The Desert View Natural Environment Area was designated in the Notice of Proposed Classification of Public Lands for Multiple Use Management, published in the Federal Register on September 25, 1970, p. 14948, to "preserve stands of Joshua trees, Yucca, and other desert vegetation that merits special attention and care to insure their preservation in

their natural condition." The designation further creates a scenic corridor from U.S. Highway 95 to the edge of the Toiyabe National Forest along the heavily used Lee Canyon Road.

According to the CFR (2071.1(iii)), a natural environment area also includes a "natural setting suitable for recreation...usually in combination with other uses." Little use of any kind occurs in this natural area now. Since the goal of most users of the Lee Canyon Road is to reach the National Forest, the best current use of the area is its continued existence as a relatively undisturbed stretch of Mohave Desert.

Sunrise Mountain Outstanding Natural Area: Sunrise Mountain Outstanding Natural Area was designated in the Notice of Proposed Classification of Public Land for Multiple Use Management in 1970. According to 43 CFR 8352, an outstanding natural area is to be managed for the maximum amount of recreational use possible without damage to the features that make the area outstanding. Geological formations of varied color, scale, and origin are the dominant scenic attractions in the western portion. The eastern half is characterized by more subtly contoured alluvial plains cut by desert washes and arroyos. The highly mineralized soils in large part determine the plant life and wildlife species of this ecosystem. Those plants tolerant of the extensive gypsum and silica deposits are typically common members of the creosote-dominated desert shrub community. Mesquite, catclaw, and tamarisk line the watercourses. Of special interest are the century plant, Agave utahensis, and the bearpoppy, Arctomecon californica. Briefly during mid-spring, the most barren gypsum flats play host to a highly localized stand of yellow bearpoppy. Extensive ORV use in this natural area presents a threat to this species in the southern portion of its range. Because it lies in proximity to Las Vegas and is so easily accessible via Lake Mead Boulevard, this sector has proven to be extremely vulnerable to widespread shooting, ORV hill climbing, and refuse dumping activities which have produced extremely severe impacts.

At this point in time it is necessary to review this Natural Area to determine whether it is possible to reverse the damage which has occurred. There have been suggestions that this may not be feasible and that its Natural Area designation be removed instead.

Piute Valley--Joshua Tree Forest Proposed Natural Area:
Piute Valley--Joshua Tree Forest was proposed as an

Popular attractions include a model Old West town, picnic areas, horseback riding, a zoo, restaurant, and bar. Future developments proposed for Bonnie Springs Ranch include a several-hundred-unit RV park, swimming pool, and trout fishing ponds.

*** The existing and proposed recreation activities do and will place demands on the adjacent lands. Equestrians and hikers could benefit from trails tying into the proposed RRCRL trail network.

Virgin Valley Planning Unit

Warm Springs Desert Oasis: Natural warm springs are the highlight of this 50-acre parcel which is bounded by BLM administered and private lands. Located in the southwestern extent of the Meadow Valley, the palm trees and grassy fields of the site contrast with the adjacent creosote bush vegetation community.

Existing facilities include a water slide, snack bar, game room, two pools, playing fields, and 75 picnic tables. Club membership is required to use some of the facilities. An extensive \$50 million expansion for the Warm Springs Site is planned to begin construction in 1981 (Pummer, personal communication, 1980). The project is proposed to include tennis courts, saunas, 40 condominium units, a restaurant, a bar, health facilities, and riding stables.

This major expansion would place additional needs on the adjacent public lands. The owner has identified the need for land for an oxidation lagoon, horse trails, and retaining an open space corridor.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

C. Management Areas

Under 43 CFR Part 2070, BLM is authorized to identify and name sites for various purposes, where appropriate. The lands so designated are either (1) classified for retention for multiple use management; or (2) withdrawn or reserved for special and specific management consideration. There are five types of areas and sites which may be designated. Of these, this section is concerned with the first type -- Recreation Lands. Under Recreation Lands there are six classes defined: Class I - high density recreation areas; Class II - general outdoor recreation areas; Class III - natural environment areas; Class IV - outstanding natural areas; Class V - primitive areas; and Class VI - historic and cultural sites.

Under the authority contained in 43 CFR Part 8223, BLM may also establish areas as Research Natural Areas. The areas established under this authority are managed differently than those areas designated under 43 CFR Part 2070.

1. Natural Areas

The Natural Areas discussed in this section are either Class III or Class IV Recreation Lands, or Research Natural Areas. All management actions potentially affecting a designated area would be assessed under the provisions of NEPA, and incompatible uses would not be allowed.

The existing Las Vegas District Natural Areas were classified as either "research" or "outstanding" in the 1975 Department of Interior Directory of Natural Areas. The Federal Register notices designating the following Natural Areas are located at the end of the Natural Areas discussion.

Stateline Planning Unit

Pine Creek Research Natural Area: A research natural area is technically under the still-embryonic Natural History Management Program, but for convenience is included here. A research natural area (43 CFR 8223) contains natural characteristics that are unusual or that are of scientific or other special interest. Visitor use may be severely limited.

Pine Creek Natural Area was designated in 1965, under Public Lands Order 3530. The Natural Area encompasses a 150-acre sector in the north fork of Pine Creek Canyon, on the eastern flanks of the escarpment in the Red Rock Canyon Recreation Lands. Within its boundaries exist one of the finest representations of riparian biota in southern Nevada.

Outstanding Natural Area in the 1975 Stateline MFP. The density maintained here by large mature joshua trees is this area's outstanding feature. The highest concentration of trees begins one mile west of Searchlight, from which it sweeps upward toward the southernmost extension of the Highland and McCullough Mountain Ranges and downward toward the New York Mountains as far as the Nevada/California border. This northern arm of the Piute Valley with its gently contoured alluvial fans has long supported extensive livestock grazing. Developments linked to this dominant activity are abundant throughout, including watertanks and windmills at several developed springs, corrals, reservoirs, and an extensive road system. Other evidence of man includes a large privately owned ranch, high voltage power transmission lines, a radio communications facility, and waysides along State Route 68, which provides primary access through the center of the forest. Creosote and blackbrush constitute the bulk of the sparse vegetative understory with the corresponding desert wildlife species typically found there. Reviewing this area in their National Natural Landmarks inventory, Bostick et al. speculated that in the process of reducing competing vegetation, the extensive grazing this land experiences may actually benefit propagation of the joshua trees (Bostick et al. 1975). They also observed, however, that this activity by the same token has served to alter the truly natural condition of the area. Bostick et al. concluded that this area is not worthy of designation as a National Natural Landmark. The northeastern portion of this forest lies within the tentative boundary of the proposed McCullough Mountains National Natural Landmark.

Cottonwood Cholla Proposed Natural Area: The Cottonwood Cholla Forest was proposed an Outstanding Natural Area in the 1975 Stateline MFP. Driving eastward from Searchlight to Lake Mead on the Cottonwood Cove Road, travelers pass through the midst of one of the most extensive stands of teddy bear cholla to be found in southern Nevada. The concentrated stands which dominate this open expanse of floor frequently yield specimens attaining heights of five feet. Several other cactus species lie interspersed among this unique cholla garden, such as the well-represented barrel cactus. Underlying vegetation is sparse, composed of shrubs and annuals typical of the surrounding creosote bush community. The Eldorado Mountains to the north and the Newberry Mountains to the south encircle the cholla-blanketed valley. This highly scenic backdrop opens out to afford a panoramic view of Lake Mead National Recreation Area, which is contiguous to the proposed natural area's eastern edge. Typical desert animal life is abundant. The

Cottonwood Cove Road, a powerline road, and a small graveyard located alongside the latter road, are the primary reminders of man's presence. Game bird hunting, camping, hiking, photography, and sightseeing are available here. This area is a prime candidate for interpretive developments at presently established turnouts. Scientific studies would enhance understanding and management of this unique desert community.

Potosi Barrel Cactus Proposed Natural Area: This area was proposed as an Outstanding Natural Area in the 1975 Stateline MFP. It is a showcase for cacti and other plant forms typical of the western Mohave desert. While the species found here are not unusual when viewed independently of each other, this area encompasses a diverse range of the joshua tree/creosote vegetation and wildlife community. Desert tortoises are found here, the area of highest concentration lying seven miles southeast of Potosi Mountain. Here, the upwarped sedimentary ridges and eroded knolls which rise abruptly from the gravel wash provide rock ledges, steep slopes, and shallow alcoves where cacti--most commonly prickly pear, hedgehog, several chollas, barrel, agave, and yucca species--grow in profusion.

Vehicular access is seasonally variable on rough dirt roads from Potosi Pass or Goodsprings. Most activity along the dirt road that loops through this area appears to be related to mining and recreation. Though many staked mining claims are visible throughout, these foothills appear free of major impacts and developments and possess an overall natural quality. The recreational activities available in this remote setting include rockhounding, hiking, camping, botanical nature studies, and geological studies.

Virgin Valley Planning Unit

Virgin Mountain Natural Area: Under the Notice of Proposed Classification of Public Lands for Multiple Use Management, 6,560 acres in the Virgin Mountain Range were designated as a BLM Natural Area in 1970. It lies approximately 85 miles northeast of Las Vegas, south of Mesquite, Nevada. This range is of particular scientific interest because it encompasses features representative of three major North American desert life zones. A merger here of the southern Great Basin, eastern Mohave, and northern Sonoran deserts occurs within the Natural Area boundaries. For this reason the Virgin Mountains are a widely recognized source from which to glean greater understanding of these regions. Immediately beneath the north and south peaks on the northern slope exists a relict coniferous forest containing

white fir, Clark County's sole stand of douglas fir, ponderosa pine, the only stand of Arizona cypress in Nevada, aspen, and several plant species considered to be at the outside edges of their ranges. Pinyon-juniper and oak scrub communities provide the dense vegetative understory blanketing the rugged limestone slopes and ridges which, in conjunction with the steep gradients characterizing the topography, restrict access to two four-wheel-drive roads which approach from the northeast and south. Some impacts have resulted from mining activities, livestock grazing, and wildfires which have occurred in the past. In view of the outstanding scenic, botanical, zoological, geological, prehistoric, and historic qualities remaining here these impacts are not overwhelming. Bighorn sheep have recently been reintroduced near the peaks, and mule deer also inhabit the mountains. In the past there have been confirmed sightings of peregrine falcons.

*** This Natural Area presents prime opportunities to pursue hiking, camping, hunting, backpacking, rockhounding, and photographic activities, as well as being a perfect outdoor classroom for ecological studies. Visitation in the Natural Area at present appears minimal because no recreation-related impacts are obvious. The entire range may meet criteria for consideration under the Areas of Critical Environmental Concern (ACEC) program.

Paradise Valley Proposed Natural Area: Paradise Valley in the Gold Butte region was proposed as an Outstanding Natural Area in the 1975 Virgin Valley MFP. Stratified limestone ridges and occasional red sandstone exposures provide a spectacular geologic backdrop for the dense joshua tree forest which blankets the valleys within this area. The narrow washes of Paradise Valley, Valatier Wash, and Horse Spring lie sandwiched between escarpments which parallel the entire eastern flank of Tramp Ridge. The sinuate green silhouettes of complexly branched joshua trees stand in counterpart to the light grays, yellows, and bright red hues of the horizontally banded rock. Valley vistas open out toward the Virgin Mountains in the north while affording equally outstanding scenic views toward Gold Butte and Lake Mead National Recreation Area to the south. Extensive mining occurred in the Gold Butte district and some disturbances remaining from this activity are visible on claims lying along the eastern and southern edges of the area. Moderate livestock grazing past and present has caused some alteration in the vegetative understory. The degree to which these impacts detract from the area's overall natural integrity is far outweighed by the values which have been maintained in this unique ecosystem.

Public Land Order 3530
Pine Creek Research Natural Area

F.R. No. 23
Vol. No. 30
Pages 1193-1194
F.R. dated 2/4/65

e 43—PUBLIC LANDS:
INTERIOR

Chapter II—Bureau of Land Manage-
ment, Department of the Interior

APPENDIX—PUBLIC LAND ORDERS

[Public Land Order 3530]

[83702]

CERTAIN STATES

Withdrawal for Protection of Natural
Areas on the Public Lands

By virtue of the authority vested in
the President and pursuant to Executive

Order No. 10355 of May 26, 1952 (17 F.R.
4831), it is ordered as follows:

1. Subject to valid existing rights, the
following described public lands, which
are under the jurisdiction of the Secre-
tary of the Interior, are hereby with-
drawn from all forms of appropriation
under the public land laws, including the
mining laws (Ch. 2, Title 30 U.S.C.), but
not from leasing under the mineral leas-
ing laws, for the protection of unique
botanical, geological, or zoological char-
acteristics and of irreplaceable scientific
and recreation values:

ARIZONA

GILA AND SALT RIVER MERIDIAN

Turbinella and Gambel Oak Area

T. 39 N., R. 14 W.,
Sec. 12, SE $\frac{1}{4}$ and E $\frac{1}{2}$ SW $\frac{1}{4}$.
Containing 240 acres.

CALIFORNIA

MOUNT DIABLO MERIDIAN

Baker Cypress and Lava Rock Area

T. 39 N., R. 4 E.,
Sec. 13, unsurveyed.
T. 39 N., R. 5 E.,
Sec. 17, lot 4 and S $\frac{1}{2}$ S $\frac{1}{2}$;
Sec. 18, S $\frac{1}{2}$ SE $\frac{1}{4}$ and NE $\frac{1}{4}$ SE $\frac{1}{4}$;
Sec. 19, NE $\frac{1}{4}$;
Sec. 20, lots 1 to 4, inclusive, and S $\frac{1}{2}$ N $\frac{1}{2}$.
Containing 1,448.43 acres.

Plute Cypress Area

T. 27 S., R. 33 E.,
Sec. 19, S $\frac{1}{2}$.
T. 27 S., R. 35 E.,
Sec. 24, SE $\frac{1}{4}$ and E $\frac{1}{2}$ SW $\frac{1}{4}$;
Sec. 25, NE $\frac{1}{4}$ and NE $\frac{1}{4}$ NW $\frac{1}{4}$.
Containing 760 acres.

Bitterbrush Area

T. 35 N., R. 17 E.,
Sec. 22, SE $\frac{1}{4}$;
Sec. 23, SW $\frac{1}{4}$;
Sec. 26, NW $\frac{1}{4}$;
Sec. 27, NE $\frac{1}{4}$.
Containing 640 acres.

COLORADO

NEW MEXICO PRINCIPAL MERIDIAN

Rare Lizard and Snake Area

T. 36 N., R. 20 W.,
Sec. 22, S $\frac{1}{2}$;
Sec. 27, NW $\frac{1}{4}$.
Containing 480 acres.

SIXTH PRINCIPAL MERIDIAN

High Mesa Grassland Area

T. 18 S., R. 72 W.,
Sec. 5, S $\frac{1}{2}$ and S $\frac{1}{2}$ N $\frac{1}{2}$;
Sec. 6, N $\frac{1}{2}$ SE $\frac{1}{4}$;
Sec. 8, W $\frac{1}{2}$ NE $\frac{1}{4}$ and SE $\frac{1}{4}$ NW $\frac{1}{4}$.
Containing 435 acres.

Sand Dune Area

T. 10 N., R. 78 W.,
Sec. 6, lots, 1, 2, 3, 4, 5, 6, 7, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$
NW $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, and N $\frac{1}{2}$ SE $\frac{1}{4}$.
Containing 671.25 acres.

IDAHO

BOISE MERIDIAN

Grassland Kipuka Area

T. 1 N., R. 24 E.,
Sec. 29, NW $\frac{1}{4}$.
Containing 160 acres.

China Cup Butte Area

T. 2 S., R. 29 E.,
Sec. 4, E $\frac{1}{2}$ SW $\frac{1}{4}$ and W $\frac{1}{2}$ SE $\frac{1}{4}$.
Containing 180 acres.

NEVADA

MOUNT DIABLO MERIDIAN

Bristlecone Pine Area

T. 19 N., R. 62 E.,
Sec. 26, E $\frac{1}{2}$;
Sec. 35, NE $\frac{1}{4}$.
Containing 480 acres.

Pinon-Joshua Tree Transition Area

T. 3 S., R. 38 E.,
Sec. 32.
Containing 640 acres.

Mountain Meadows Area

T. 12 N., R. 51 E.,
Sec. 21, E $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$.
Containing 22 acres.

Pygmy Sage Area

T. 14 N., R. 67 E.,
Sec. 33, SW $\frac{1}{4}$.
Containing 160 acres.

Pine Creek Canyon Area

T. 21 S., R. 58 E.,
Sec. 17, N $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$,
NW $\frac{1}{4}$ NW $\frac{1}{4}$, and N $\frac{1}{2}$ NE $\frac{1}{4}$.
Containing 240 acres.

OREGON

WILLAMETTE MERIDIAN

Brewer Spruce Area

T. 39 S., R. 6 W.,
Sec. 5, N $\frac{1}{2}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ and SW $\frac{1}{4}$ NW $\frac{1}{4}$
SW $\frac{1}{4}$;
Sec. 6, NE $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$, S $\frac{1}{2}$ NW $\frac{1}{4}$
SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$, and
S $\frac{1}{2}$ lot 7.
Containing 210.36 acres.

Douglas Fir Area

T. 27 S., R. 10 W.,
Sec. 17, W $\frac{1}{2}$ W $\frac{1}{2}$ SW $\frac{1}{4}$;
Sec. 18, S $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$, lots 7 and 12, N $\frac{1}{2}$
of 8;
Sec. 19, N $\frac{1}{2}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ lot 1, E $\frac{1}{2}$ lot 1;
Sec. 20, W $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$.
Containing 815 acres.

2. The withdrawal made by this order
does not alter the applicability of those
public land laws governing the use of the
lands under lease, license or permit, or
governing the disposal of their mineral
and vegetative resources other than
under the mining laws.

STEWART L. UDALL,
Secretary of the Interior.

JANUARY 29, 1965.

[F.R. Doc. 65-1199; Filed, Feb. 3, 1965;
8:46 a.m.]

Posted to Bulletin Board
Removed from Bulletin Board

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Desert View
Natural Environment Area

the mineral leasing and material sale laws. As used in this order, the term "lands" means any lands within any lands with- by Executive Order number 26, 1934, as a grazing district es- of the Act of June 26, 1934 (48 Stat. 1209), as amended, which are not otherwise withdrawn or reserved for a Federal use or purpose.

2. The area described in paragraph 5 below is hereby designated as "The Desert View Natural Environment Area," CFR 2071.1(1)(iii). This area contains outstanding stands of Joshua trees, Yucca, and other desert vegetation that merits special attention and care in management to insure their preservation in their natural condition. This scenic corridor will extend from U.S. Highway 95 and continue along both sides of the Lee Canyon Highway (State Route 52) and will pass through the Pristine Desert vegetative zone from the lower sonoran to the subalpine zone.

These lands are being classified and/or designated as a result of (1) suggestions received at public meetings, (2) written comments and (3) staff studies conducted by the Bureau of Land Management, and have been discussed with local governmental officials.

The classification of public lands along U.S. Highway 95 will result in a scenic corridor being established between a point approximately 4 miles north of the Kyle Canyon Road and the town of Indian Springs. Such a classification will help eliminate "strip" development along the highway.

The proposal to classify public lands around Devils Hole, a portion of the Death Valley National Monument, will preclude disposal, hence assist in the protection of the environment of Devils Hole in which is located the Nevada Pupfish, a rare and endangered species of desert fish.

The public lands proposed for classification, described below, are shown on maps designated N-257-B on file in the Las Vegas District Office, Bureau of Land Management, 1859 North Decatur Boulevard, Las Vegas, Nev. 89108, and the Nevada Land Office, Bureau of Land Management, Room 3104, Federal Building, 300 Booth Street, Reno, Nev. 89502.

3. The following described public lands are proposed to be classified for multiple use management:

MOUNT DIABLO MERIDIAN, NEVADA

T. 16 S., R. 56 E.
Secs. 11, 12, 13, 14, 24.
T. 16 S., R. 57 E.
Sec. 17, NW¼, S¼;
Secs. 18, 19;
Sec. 20, N¼, N¼S¼, SW¼SW¼;
Sec. 21, NW¼, N¼SW¼, SE¼SW¼, SE¼;
Sec. 27, NW¼, S¼;
Sec. 29, NE¼, NE¼NW¼, S¼NW¼, S¼;
Sec. 29, NW¼NW¼, S¼N¼, S¼;
Secs. 30, 32, 33, 34;
Sec. 35, NW¼, S¼.
T. 17 S., R. 50 E.
Sec. 35, E¼NE¼, N¼NE¼SE¼.
T. 17 S., R. 57 E.,
Sec. 1.

Sec. 5, NW¼, S¼;
Secs. 6, 7, 8;
Sec. 9, NW¼, S¼;
Sec. 10, SW¼SW¼;
Sec. 13, NE¼, S¼;
Sec. 14, NW¼SW¼, S¼SW¼;
Sec. 15, NW¼NE¼, S¼NE¼, NW¼, S¼;
Secs. 16, 21, 22, 23, 24, 25, 26, 35, 36.
T. 17 S., R. 52 E.
Secs. 13, 20, 23, 30, 31, 32.
T. 18 S., R. 50 E.
Sec. 1, N¼N¼;
Sec. 2, NE¼.
T. 18 S., R. 53 E.,
Secs. 1, 12.
T. 18 S., R. 59 E.,
Secs. 1, 2, 3;
Sec. 4, NE¼, S¼;
Secs. 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20;
Sec. 21, N¼, N¼S¼;
Secs. 27, 29, 30, 31.

The area described above totals approximately 41,800 acres.

4. The following described public land are further segregated from appropriation under the general mining laws:

T. 17 S., R. 50 E.,
Sec. 35, E¼NE¼, N¼NE¼SE¼;
Sec. 36, NE¼, W¼, N¼SE¼, SE¼SE¼.
T. 17 S., R. 51 E.,
Sec. 31, NE¼NE¼, W¼E¼, W¼.
T. 18 S., R. 50 E.,
Sec. 1, N¼N¼;
Sec. 2, NE¼.
T. 18 S., R. 51 E.,
Sec. 6, NW¼, N¼SW¼, W¼NE¼, SE¼.

The area described above totals approximately 2,920 acres.

5. The following described area is hereby designated as "The Desert View Natural Environment Area":

T. 17 S., R. 57 E.,
Sec. 25, SE¼;
Sec. 35, SE¼;
Sec. 36, all.
T. 17 S., R. 58 E.,
Sec. 14, NW¼SW¼, S¼SW¼;
Sec. 15, NW¼NE¼, S¼NE¼, NW¼, S¼;
Secs. 16, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29,
Sec. 30, NE¼, S¼;
Sec. 31;
Sec. 32, NW¼;
Sec. 33, NE¼;
Secs. 34, 35, 36.
T. 18 S., R. 56 E.,
Sec. 24, NE¼, S¼.
T. 18 S., R. 57 E.,
Secs. 1, 2;
Sec. 3, S¼;
Sec. 8, S¼;
Secs. 9, 10;
Sec. 11, N¼;
Sec. 12, N¼;
Sec. 16, N¼;
Sec. 17;
Sec. 18, S¼;
Sec. 19;
Sec. 20, N¼.

The area described above totals approximately 16,640 acres.

6. For a period of 60 days from the date of publication of this notice in the FEDERAL REGISTER, all persons who wish to submit comments, suggestions, or objections in connection with the proposed classification may present their views in writing to the District Manager, Bureau of Land Management, 1859 North Decatur Boulevard, Las Vegas, Nev. 89108.

7. The area designations have previously been classified in part, and proposed to be classified in part by publication of this notice. These designations are effective on lands presently classified and will become effective upon final classification of lands proposed to be classified.

Serial No. N-257-B1

NEVADA

Bureau of Proposed Classification of
Public Lands for Multiple-Use
Management

SEPTEMBER 17, 1970.

Pursuant to the Act of September 19, 1964 (43 U.S.C. 1411-18) and the regulations in 43 CFR, Parts 2400-2410, it is proposed to classify the public lands within the area described below for multiple-use management. Publication of this notice segregates all public lands described in this notice from appropriation under the Homestead, Desert Land and Allotment Laws (43 U.S.C., chapters 7 and 9; and 25 U.S.C. 334), and from sale under section 5 of the Revised Statutes (43 U.S.C. 1) and the Public Land Sale Act of September 19, 1964 (43 U.S.C. 1421-27). The land described in paragraph 4 below is further segregated from appropriation under the general mining laws but not

Virgin River Recreation Lands Virgin Mountain Natural Area

Las Vegas Dunes Recreation Lands Sunrise Mountain Outstanding Natural Area

ROLLA E. CHANDLER,
Manager, Nevada Land Office.

8:50 a.m.]

[Serial No. N-1575-A]

NEVADA

Notice of Proposed Classification of Public Lands for Multiple-Use Management

SEPTEMBER 17, 1970.

1. Pursuant to the Act of September 19, 1964 (43 U.S.C. 1411-18) and to the regulations in 43 CFR Part 2400, it is proposed to classify the public lands within the area described in paragraph 3 below for multiple-use management. Publication of this notice has the effect of segregating all the public lands described in this notice from appropriation under the homestead, desert land and agricultural laws (43 U.S.C., Chapter 7 and 9, 25 U.S.C. 331), and from sale under section 2455 of the Revised Statutes (43 U.S.C. 1171), and exchange (43 U.S.C. 315), and the Public Land Sale Act of September 19, 1964 (43 U.S.C. 1421-27).

2. The lands described below are being classified and/or designated as a result of (1) suggestions received by the Bureau of Land Management at the public hearing held March 5, 1969, on the Clark County Multiple-Use Classification, (2) at subsequent public meetings, (3) written comments and (4) staff studies conducted by the Bureau of Land Management, and have been discussed with local governmental officials. Also included in paragraphs 3 and 4 of the classification notice are some 5,800 acres of land presently classified for disposal under the Recreation and Public Purposes Act. These lands have been identified as being needed for future public purposes such as school sites, park sites, flood control channels, etc. The Recreation and Public Purposes Act Classification contemplates immediate disposal, and such is not the case for these lands. Therefore, the lands are being classified and segregated from all forms of disposal except under authority of the Recreation and Public Purposes Act—such disposal to be at some future date.

Five areas, listed in paragraphs 6, 7, 8, 9, and 10 below, have unique physical characteristics and are being designated as such so that more persons become aware of them and they can more fully appreciate and utilize the areas.

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The public lands proposed for classification are located within Clark County, Nev. The area identified for classification is shown on maps, which are on file in the Las Vegas District Office, Bureau of Land Management, 1859 North Decatur Boulevard, Las Vegas, Nev., and the Land Office, Bureau of Land Management, Room 3104, Federal Building, 300 Booth Street, Reno, Nev.

3. The public lands proposed to be classified for multiple-use management are described as follows:

MOUNT DIABLO MERIDIAN, NEVADA

- T. 13 S., R. 70 E.,
Sec. 27, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 32, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$;
Sec. 33, S $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$,
W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;
Sec. 34, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.
T. 14 S., R. 70 E.,
Sec. 4, NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 5, E $\frac{1}{2}$, SW $\frac{1}{4}$;
Sec. 6, S $\frac{1}{2}$;
Sec. 7, N $\frac{1}{2}$;
Sec. 8, N $\frac{1}{2}$;
T. 14 S., R. 69 E.,
Sec. 14, E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 15, SE $\frac{1}{4}$ SE $\frac{1}{4}$;
Sec. 22, all;
Sec. 27, all;
Sec. 28, NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$,
SW $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 32, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$,
N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$.
T. 19 S., R. 60 E.,
Sec. 1, lots 1, 2, 3, 4, S $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$.
T. 19 S., R. 61 E.,
Sec. 5, S $\frac{1}{2}$;
Sec. 6, lots 1, 2, 3, 4, 5, 6, S $\frac{1}{2}$ NE $\frac{1}{4}$,
SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$;
Sec. 7, lot 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$;
Secs. 8, 9, and 10, all;
Sec. 15, N $\frac{1}{2}$;
Sec. 16, N $\frac{1}{2}$;
T. 19 S., R. 62 E.,
Secs. 7 and 18, all.
T. 19 S., R. 63 E.,
Sec. 9, SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ portion east of
Highway 93;
Sec. 16, all east of Highway 93;
Sec. 17, all east of Highway 93;
Sec. 19, all east of Highway 93;
Sec. 20, all east of Highway 93;
Sec. 21, all;
Sec. 28, N $\frac{1}{2}$;
Sec. 29, N $\frac{1}{2}$;
Sec. 30, N $\frac{1}{2}$;
T. 20 S., R. 60 E.,
Sec. 9, W $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$,
E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$;
Sec. 10, NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$,
SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 15, W $\frac{1}{2}$ W $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$,
SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$,
NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$,
W $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$,
NE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$,
NW $\frac{1}{4}$ SE $\frac{1}{4}$;
Sec. 33, lots 60 and 61.

- T. 20 S., R. 62 E.,
Sec. 12, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$;
Sec. 13, all;
Sec. 24, all;
Sec. 25, all;
Sec. 35, SE $\frac{1}{4}$;
Sec. 36, all.
T. 20 S., R. 63 E. (unsurveyed).
If surveyed, lands will probably be
described as:
Sec. 7, all;
Sec. 8, W $\frac{1}{2}$;
Secs. 17, 18, 19, all.
T. 21 S., R. 60 E.,
Sec. 3, lots 46, 47, 48, 57, 58, 63, and 66;
Sec. 4, lots 49, 50, 67, 69, 70, and 99;
Sec. 10, W $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$,
NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 11, lots 18, 19, 20, 48, 47, and 50;
Sec. 13, W $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$,
NW $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 17, E $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$,
NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$;
Sec. 28, SE $\frac{1}{4}$ SE $\frac{1}{4}$;
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SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$,
SW $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$,
SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$.
T. 21 S., R. 61 E.,
Sec. 13, lot 15;
Sec. 31, lots 53, 54, 56, 57, 62, 69, 71, 73, 75,
76, 78, 79, 81, 82, SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$,
SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$,
SW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$,
NE $\frac{1}{4}$ SW $\frac{1}{4}$.
T. 21 S., R. 62 E.,
Sec. 1, N $\frac{1}{2}$, SW $\frac{1}{4}$;
Sec. 35, W $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$.
T. 22 S., R. 61 E.,
Sec. 5, lots 133 and 134;
Sec. 8, W $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$,
SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$,
SW $\frac{1}{4}$;
Sec. 10, lots 44 and 45;
Sec. 15, E $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$,
SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$,
NE $\frac{1}{4}$;
Sec. 20, lots 33, 34, and 60;
Sec. 28, lots 18, 19, 20, 21, 31, 32, 33, 34,
115, 124, 131, and 132.
T. 26 S., R. 63 E.,
Sec. 19, all;
Sec. 20, all;
Sec. 29, all;
Sec. 30, all;
Sec. 31, all;
Sec. 32, all;
Sec. 33, all.

The land described aggregates approximately 25,400 acres of public land.

4. The following public lands are further segregated from appropriation under the general mining laws but not the mineral leasing or material sale laws:

MOUNT DIABLO MERIDIAN, NEVADA

- T. 13 S., R. 70 E.,
Sec. 27, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 32, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$;
Sec. 33, S $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$,
W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;
Sec. 34, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$.
T. 14 S., R. 70 E.,
Sec. 4, NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;
Sec. 5, E $\frac{1}{2}$, SW $\frac{1}{4}$;
Sec. 6, S $\frac{1}{2}$;
Sec. 7, N $\frac{1}{2}$;
Sec. 8, N $\frac{1}{2}$.

MOUNT DIABLO MERIDIAN, NEVADA

14 S., R. 69 E.,
 Sec. 14, E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 15, SE $\frac{1}{4}$ SE $\frac{1}{4}$;
 Sec. 22, all;
 Sec. 27, all;
 Sec. 28, NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$,
 SW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 29, SW $\frac{1}{4}$;
 Sec. 32, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$,
 N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;
 T. 19 S., R. 60 E.,
 Sec. 1, lots 1, 2, 3, 4, S $\frac{1}{2}$ N $\frac{1}{2}$, SE $\frac{1}{4}$;
 T. 19 S., R. 61 E.,
 Sec. 5, S $\frac{1}{2}$;
 Sec. 6, lots 1, 2, 3, 4, 5, 6, S $\frac{1}{2}$ NE $\frac{1}{4}$,
 SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SW $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$;
 Sec. 7, lot 2, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NW $\frac{1}{4}$;
 Secs. 8, 9 and 10, all;
 Sec. 15, N $\frac{1}{2}$;
 Sec. 16, N $\frac{1}{2}$;
 T. 19 S., R. 62 E.,
 Secs. 7 and 18, all;
 T. 20 S., R. 60 E.,
 Sec. 9, W $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$,
 E $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$;
 Sec. 10, NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NE $\frac{1}{4}$,
 SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 13, E $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$,
 SE $\frac{1}{4}$, W $\frac{1}{2}$ W $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$,
 SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, NE $\frac{1}{4}$,
 NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, W $\frac{1}{2}$,
 SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$;
 Sec. 33, lots 60 and 61;
 T. 20 S., R. 62 E.,
 Sec. 12, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$;
 Sec. 13, all;
 Sec. 24, all;
 Sec. 25, all;
 Sec. 35, SE $\frac{1}{4}$;
 Sec. 36, all;
 T. 20 S., R. 63 E. (unsurveyed):
 If surveyed, lands will probably be
 described as:
 Sec. 7, all;
 Sec. 8, W $\frac{1}{2}$;
 Secs. 17 through 24, all;
 Sec. 26, all;
 T. 21 S., R. 60 E.,
 Sec. 3, lots 46, 47, 48, 57, 58, 65 and 66;
 Sec. 4, lots 49, 50, 67, 69, 70 and 99;
 Sec. 10, W $\frac{1}{2}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$,
 NW $\frac{1}{4}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 11, lots 18, 19, 20, 46, 47 and 50;
 Sec. 13, W $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$,
 NW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 17, E $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$,
 NW $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$;
 Sec. 28, SE $\frac{1}{4}$ SE $\frac{1}{4}$;
 Sec. 36, W $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$,
 NW $\frac{1}{4}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$,
 NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$,
 NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$,
 SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$,
 NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, W $\frac{1}{2}$,
 SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$, W $\frac{1}{2}$,
 NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$,
 SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$, SW $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$,
 SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$,
 SW $\frac{1}{4}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$,
 SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$;
 T. 21 S., R. 61 E.,
 Sec. 13, lot 15;
 Sec. 31, lots 53, 54, 56, 57, 62, 69, 71, 73, 75,
 78, 79, 81, 82, SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$,
 SW $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, W $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$,
 SW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$,
 NE $\frac{1}{4}$ SW $\frac{1}{4}$;
 T. 21 S., R. 62 E.,
 Sec. 1, N $\frac{1}{2}$, SW $\frac{1}{4}$;
 Sec. 35, W $\frac{1}{2}$ NE $\frac{1}{4}$ NW $\frac{1}{4}$, NW $\frac{1}{4}$ NW $\frac{1}{4}$;
 T. 22 S., R. 61 E.,
 Sec. 5, lots 133 and 134;
 Sec. 8, W $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$,
 NE $\frac{1}{4}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$,
 SW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 10, lots 44 and 45;
 Sec. 15, E $\frac{1}{2}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$,
 SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ SE $\frac{1}{4}$,
 NE $\frac{1}{4}$;

Sec. 20, lots 33, 34 and 60;
 Sec. 28, lots 18, 19, 20, 21, 31, 32, 33, 34, 115,
 124, 131 and 132.

The land described aggregates approximately 21,300 acres of public land.

5. Segregation from appropriation under the general mining laws is terminated on the following described public lands:

MOUNT DIABLO MERIDIAN, NEVADA

T. 15 S., R. 71 E. (unsurveyed):
 Sec. 20, NW $\frac{1}{4}$ NW $\frac{1}{4}$.

The land described above totals approximately 40 acres.

6. The area described below is hereby designated as the "Virgin River Recreation Lands" for the protection of habitat of interesting, rare and unusual plants and animals (CFR 2071.1(b)(1)). This land has a high potential for future development for waterfowl and upland game birds that are in limited supply in southern Nevada. The lands involved are described as follows:

MOUNT DIABLO MERIDIAN, NEVADA

T. 13 S., R. 70 E.,
 Sec. 27, SW $\frac{1}{4}$ SE $\frac{1}{4}$, SE $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 32, S $\frac{1}{2}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$;
 Sec. 33, S $\frac{1}{2}$ NW $\frac{1}{4}$, SE $\frac{1}{4}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$,
 W $\frac{1}{2}$ SE $\frac{1}{4}$, NE $\frac{1}{4}$ SE $\frac{1}{4}$;
 Sec. 34, NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;
 T. 14 S., R. 69 E.,
 Sec. 14, E $\frac{1}{2}$ SW $\frac{1}{4}$, NW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 15, SE $\frac{1}{4}$ SE $\frac{1}{4}$;
 Sec. 22, all;
 Sec. 27, all;
 Sec. 28, NE $\frac{1}{4}$, N $\frac{1}{2}$ SE $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$,
 SW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 29, SW $\frac{1}{4}$;
 Sec. 32, N $\frac{1}{2}$ NE $\frac{1}{4}$, SW $\frac{1}{4}$ NE $\frac{1}{4}$, E $\frac{1}{2}$ NW $\frac{1}{4}$,
 N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;
 T. 14 S., R. 70 E.,
 Sec. 4, NE $\frac{1}{4}$, NW $\frac{1}{4}$, N $\frac{1}{2}$ SW $\frac{1}{4}$, SW $\frac{1}{4}$ SW $\frac{1}{4}$;
 Sec. 5, E $\frac{1}{2}$, SW $\frac{1}{4}$;
 Sec. 6, S $\frac{1}{2}$;
 Sec. 7, N $\frac{1}{2}$;
 Sec. 8, N $\frac{1}{2}$;

Totaling approximately 4,930 acres.

7. The area described below is hereby designated as the "Virgin Mountain Natural Area" for the protection of unusual flora and fauna that is found nowhere else in southern Nevada.

MOUNT DIABLO MERIDIAN, NEVADA

T. 15 S., R. 70 E.,
 Sec. 24, all;
 Sec. 25, all;
 T. 15 S., R. 71 E. (unsurveyed),
 Sec. 17, S $\frac{1}{2}$ S $\frac{1}{2}$;
 Sec. 19, all;
 Sec. 20, all;
 Sec. 21, all;
 Sec. 27, all;
 Sec. 28, all;
 Sec. 29, all;
 Sec. 22, all;
 Sec. 30, all.

Total approximately 6,560 acres.

8. The area described below is hereby designated as the "Highland Range Crucial Bighorn Habitat Area" (CFR 2071-1). This area supports an unusual concentration of Nelson's bighorn sheep. It has been identified in an approved HMP as crucial to survival of a bighorn herd, and in need of special management for protection and maintenance of the vegetation and wildlife habitat.

MOUNT DIABLO MERIDIAN, NEVADA

T. 26 S., R. 62 E.,

Sec. 21, all;
 Sec. 22, all;
 Sec. 23, all;
 Sec. 24, all;
 Sec. 25, all;
 Sec. 26, all;
 Sec. 27, all;
 Sec. 28, all;
 Sec. 33, all;
 Sec. 34, all;
 Sec. 35, all;
 Sec. 36, all;
 T. 27 S., R. 62 E.,
 Sec. 1, all;
 Sec. 2, all;
 Sec. 3, all;
 Sec. 10, all;
 Sec. 11, all;
 Sec. 12, all;
 Sec. 13, all;
 Sec. 14, all;
 Sec. 15, all;
 T. 26 S., R. 63 E.,
 Sec. 19, all;
 Sec. 20, all;
 Sec. 29, all;
 Sec. 30, all;
 Sec. 31, all;
 Sec. 32, all;
 Sec. 33, all;
 T. 27 S., R. 63 E.,
 Sec. 3, W $\frac{1}{2}$;
 Sec. 4, all;
 Sec. 5, all;
 Sec. 6, all;
 Sec. 7, all;
 Sec. 8, all;
 Sec. 9, all;
 Sec. 10, all;
 Sec. 15, all;
 Sec. 16, all;
 Sec. 17, all;
 Sec. 18, all;

Totaling approximately 25,280 acres.

9. The area described below is hereby designated as "Las Vegas Dunes Recreation Lands" (CFR 2071.1(b)(1)). These lands have been identified as having high value for off-road recreational vehicle use.

MOUNT DIABLO MERIDIAN, NEVADA

T. 19 S., R. 63 E.,
 Sec. 9, SE $\frac{1}{4}$, S $\frac{1}{2}$ SW $\frac{1}{4}$ portion east of Highway 93;
 Sec. 10, all;
 Sec. 11, all;
 Sec. 13, SW $\frac{1}{4}$;
 Sec. 14, all;
 Sec. 15, all;
 Sec. 16, all east of Highway 93;
 Sec. 17, all east of Highway 93;
 Sec. 19, all east of Highway 93;
 Sec. 20, all east of Highway 93;
 Sec. 21, all;
 Sec. 22, all;
 Sec. 23, all;
 Sec. 24, W $\frac{1}{2}$;
 Sec. 25, W $\frac{1}{2}$;
 Sec. 28, all;
 Sec. 27, N $\frac{1}{2}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$;
 Sec. 28, N $\frac{1}{2}$;
 Sec. 29, N $\frac{1}{2}$;
 Sec. 30, N $\frac{1}{2}$;

The area above described aggregates approximately 9,000 acres.

10. The area described below is hereby designated as the "Sunrise Mountain Natural Area" (CFR 2071-1). This area has been identified as having unique geologic, biologic, and esthetic values.

MOUNT DIABLO MERIDIAN, NEVADA

- S. R. 62 E.,
 12, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, E $\frac{1}{2}$ NE $\frac{1}{4}$;
 all;
 all;
 all;
 S. 35, SE $\frac{1}{4}$;
 Sec. 36, all;
 T. 20 S., R. 63 E. (unsurveyed)
 If surveyed, lands will probably be described as:
 Sec. 7, all;
 Sec. 8, W $\frac{1}{2}$;
 Sec. 17 through 24, all;
 Sec. 26, all;
 T. 21 S., R. 62 E.,
 Sec. 1, N $\frac{1}{2}$, SW $\frac{1}{4}$.

Containing about 10,240 acres of public domain lands.

11. For a period of 60 days from the date of publication of this notice in the FEDERAL REGISTER, all persons who wish to submit comments, suggestions, or objections in connection with the proposed classification may present their views in writing to the District Manager, Bureau of Land Management, 1859 North Decatur Boulevard, Las Vegas, Nev. 89108.

12. The area designations have previously been classified in part, and proposed to be classified in part by publication of this notice. These designations are effective on lands presently classified and will become effective upon final classification of lands proposed to be classified.

13. A public hearing on the proposed classification will be held on Friday, October 30, 1970, at 1:30 p.m., in the North Las Vegas City Hall, 2200 Civic Center Dr., North Las Vegas, Nev. 89030.

State Director:

ROLLA E. CHANDLER,
 Manager, Nevada Land Office.

[F.R. Doc. 70-12815; Filed, Sept. 24, 1970;
 8:50 a.m.]

DEPARTMENT OF AGRICULTURE

Forest Service

EAGLES NEST WILDERNESS

Proposal and Hearing Announcement

Notice is hereby given in accordance with provisions of the Wilderness Act of September 3, 1964 (Public Law 88-577; 78 Stat. 890, 892; 16 U.S.C. 1131, 1132) that the public hearing scheduled on October 8, 1970, at the Summit County High School Auditorium, Frisco, Colo., on a proposal for the establishment of the Eagles Nest Wilderness (F.R. Doc. 70-11021; filed Aug. 20, 1970; and published in FEDERAL REGISTER, Vol. 35, No. 163, Friday, Aug. 21, 1970) will be continued on October 12, 1970, at 9 a.m. at the Auditorium, Building 56, Denver Federal Center, vicinity of Sixth Avenue and Kipling Street, Denver, Colo.

A brochure containing a map and information about the proposed Wilderness may be obtained from the Forest Supervisor, Arapaho National Forest, 1010 Street, Post Office Box 692, Golden, 80401, or the Forest Supervisor, River National Forest, Old Fed-

eral Building, Post Office Box 948, Glenwood Springs, Colo. 81601, or the Regional Forester, Building 85, Denver Federal Center, Denver, Colo. 80225.

Individuals or organizations may express their views by appearing at this hearing in Frisco or Denver, Colo., or they may submit written comments for inclusion in the official record to the Regional Forester at the above address by November 9, 1970.

A. W. GREELEY,
 Associate Chief, Forest Service.

[F.R. Doc. 70-12803; Filed, Sept. 24, 1970;
 8:48 a.m.]

Office of the Secretary

COMMODITY CREDIT CORPORATION

Organization and Functions and Delegations of Authority

I. General. The Commodity Credit Corporation Charter Act on June 29, 1948 (15 U.S.C. 714) established the Commodity Credit Corporation (hereinafter referred to as CCC), effective July 1, 1948, under a permanent Federal Charter, as an agency and instrumentality of the United States within the U.S. Department of Agriculture, subject to the general supervision and direction of the Secretary of Agriculture. Originally, CCC had been incorporated under the laws of the State of Delaware, pursuant to section 2(a) of the National Industrial Recovery Act of June 16, 1933, and Executive Order 6340 of October 16, 1933. The principal office of CCC is at the U.S. Department of Agriculture, Washington, D.C. 20250.

A. Stock and Borrowing Power. CCC has capital stock of \$100 million which is subscribed by the United States, and has authority to borrow, with the approval of the Secretary of the Treasury, not to exceed an amount fixed by law.

II. Organization. A. Board of Directors. The Board of Directors consists of seven members. The Secretary of Agriculture is an ex officio director and serves as Chairman of the Board of Directors. The President of the United States, by and with the advice and consent of the Senate, appoints the remaining six members of the Board of Directors.

B. Advisory board. An advisory board of five members is appointed by the President of the United States to survey the general policies of CCC and the operations of its programs and to advise the Secretary of Agriculture with respect thereto. Not more than three members may belong to the same political party. The advisory board meets at least every 90 days.

C. Officers. The Assistant Secretary for International Affairs and Commodity Programs is ex officio President of CCC and the following officials of the Agricultural Stabilization and Conservation Service (hereinafter referred to as ASCS), Export Marketing Service (hereinafter referred to as EMS), Foreign Agricultural Service (hereinafter referred to as FAS), Consumer and Marketing Service (hereinafter referred to

as C&MS), and Food and Nutrition Service (hereinafter referred to as FNS), are ex officio officers of the CCC: The Administrator, ASCS, is Executive Vice President, CCC; the General Sales Manager, EMS, is Vice President, CCC; the Administrator, C&MS, is Vice President, CCC; the Administrator, FAS, is Vice President, CCC; the Administrator, FNS, is Vice President, CCC; the Associate Administrator, ASCS, is Vice President, CCC; the Deputy Administrator, Commodity Operations, ASCS, is Deputy Vice President, CCC; the Deputy Administrator, State and County Operations, ASCS, is Deputy Vice President, CCC; the Deputy Administrator, Management, ASCS, is Deputy Vice President, CCC; the Executive Assistant to the Administrator, ASCS, is Secretary, CCC; the Director, Fiscal Division, ASCS, is Controller, CCC; the Deputy Director, Fiscal Division, ASCS, is Treasurer, CCC; and the Chief, Accounting Systems Branch, Fiscal Division, ASCS, is Chief Accountant, CCC. Additional officers of the CCC and their respective authorities are described in the bylaws and in section IV hereof.

D. Management. The management of CCC is vested in its Board of Directors, subject to the general supervision and direction of the Secretary of Agriculture. The President of CCC is Vice Chairman of the Board and has general supervision and direction of the Corporation, its officers and employees. The Executive Vice President is the chief executive officer of CCC. His authority, together with that of the other Vice Presidents, is set forth in the bylaws and in section IV hereof. Except as otherwise authorized by the Board of Directors and the Secretary of Agriculture, operations of CCC are generally carried out through the facilities and personnel of ASCS, EMS, FAS, FNS, and C&MS in accordance with authorizations by the Board and the Secretary. From time to time, services of other agencies of the United States Department of Agriculture may be utilized on certain operations or programs. The Directors of the Divisions and Commodity Offices of ASCS serve as executives of CCC in general charge of the activities of the Corporation carried out through their respective divisions or offices.

E. Contract Appeals. Authority to consider and determine (1) all appeals from findings of fact by CCC Contracting Officers under a contract disputes provision, (2) on specific referrals by the President or a Vice President, CCC, appeals by persons on contract claims by or against CCC involving questions of fact or law, not settled or adjusted satisfactory to him and not in litigation or pending in the Department of Justice, and (3) appeals by persons barred from contracting with CCC and from other participation in CCC programs formerly vested in the CCC Contract Disputes Board, is now vested in the USDA Board of Contract Appeals and exercised in accordance with the provisions of 7 CFR Part 2400.

2. National Natural Landmarks

The National Natural Landmark (NNL) Program is administered by the Heritage Conservation and Recreation Service (HCRS), formerly the Bureau of Outdoor Recreation.

National Natural Landmarks are outstanding examples of our natural heritage, chosen to illustrate the vast array of terrestrial and aquatic communities, landforms, geological features, and native plant and animal communities.

To qualify for NNL designation (by the Secretary of Interior a site must be critically evaluated against criteria such as site condition, inherent diversity, viability, national significance, and educational and scientific values.

Private landowners may seek formal designation of their property, but must agree to prevent, insofar as possible, deterioration of the site's significant values. None of the landowner's rights or privileges are relinquished.

On lands owned by other Federal agencies, multiple use (in the case of the BLM) may continue, if the site's significant values are maintained; however, actions that may affect the critical features of a National Natural Landmark must be assessed under the provisions of NEPA. Current policy of HCRS is that no area will be designated a NNL until the managing agency has given its approval.

Two areas in Clark County have been recommended for National Natural Landmark status, the McCullough Mountains and the Frenchman Mountain-Rainbow Gardens area, both in the Stateline Planning Unit.

McCullough Mountains: "The McCullough Mountains are the least disturbed of any of the desert ranges of the south Great Basin and typify many of its features." This was the conclusion presented in the National Park Service contracted Inventory of National Natural Landmarks of the Great Basin (Bostick et al. 1975). Those activities which to varying degrees have disturbed the natural conditions have all been largely confined to the playas, gently sloping flanks, McCullough Pass, and springs. These impacts are primarily evidenced by intensive livestock grazing, backcountry access roads, hunting, mineral prospecting, and a corridor of power transmission lines from the McCullough switching station to the California state line. The widespread scarcity of water and extremely rugged topography which characterize this range have limited its development despite its proximity to Las Vegas. Consequently it is estimated that approximately one-half of the total proposed area has retained

its original ecological and geological features. Thousands of acres encompassed in each of the desert plant communities represented here--pinyon-juniper woodland, blackbrush, Joshua tree forest, and creosote bush--are virgin range. The extensive stands of black grama, Bouteloua eriopoda, found here are not known to exist anywhere else in Nevada. Twenty-two other plant species which are rare and relic have also been identified here. The higher elevational habitats support desert bighorn in the northern range and mule deer in the south. Study of the limestone and volcanic strata exposed here displays the merger between the Great Basin and Sonoran Desert sectors of the Basin and Range province.

*** The northeastern portion of the Piute Valley-Joshua Tree Proposed Natural Area lies within the tentative boundaries of the McCullough Mountains Proposed National Natural Landmark. Serious consideration of the McCullough Range for designation as a National Natural Landmark or perhaps as an ACEC is warranted, as is the investigators' suggestion that private lands and areas bearing heaviest impacts be identified and deleted from the proposal.

Frenchman Mountain/Rainbow Gardens: A rectangular block of land encompassing Rainbow Gardens, Frenchman Mountain, Sunrise Mountain, and Lava Butte was reviewed in 1975 and proposed for designation as a National Natural Landmark. It is bounded by Las Vegas on the west, Nellis Air Force base on the north, and Las Vegas Wash on the south. The environment found within is representative of a true warm desert and contains significant geological and archeological features. The entire northern portion (Sunrise Mountain Natural Area) has been severely impacted by off-road vehicles, dumping, and other land uses associated with urban areas. It would be best to eliminate this northern sector entirely from consideration and concentrate on a review of the qualities found in the more isolated southern portion. Significant and varied geological features outshine the botanical and zoological species found in the essentially barren landscape of the Rainbow Gardens area. Outstanding textbook examples of several geologic features here include strike-slip faulting, transform faulting along a crustal plate (i.e. Walker Lane), igneous intrusions, stratification, and fossil trilobite beds (see Quality Evaluations - Sightseeing - Geological). The valleys contain excessive gypsum and bentonite deposits which limit plant growth. Recreational and industrial uses present fewer impacts here although a corridor of power transmission lines does exist. Designation as an NNL would not be incompatible with the inclusion of Rainbow Gardens in the proposed Clark County Wetlands Park (see Recreation Sites - Clark County).

3. Las Vegas Dunes

Designated recreation lands (43 CFR 2071) are fairly large tracts of land where recreation is or is expected to be a major use, and designation will assist the public by making the area known. Recreation lands can be of various types, from high density developed areas to areas where natural values prevail and limit recreation use.

The Las Vegas Dunes encompasses 9,000 acres and was formally designated an Off-Road Vehicle (ORV) Play Area on September 15, 1970 (see the Federal Register Notices in the Natural Areas discussion for a copy of the designation order). The Dunes lie 15 miles northeast of Las Vegas, Nevada and access is provided along the old Salt Lake Highway. Access to the eastern side of the Dunes can be accomplished along the John- Mansville Road. This road is privately owned by Pabco Gypsum and public access is being limited.

The topography is comprised mainly of rolling sand dunes, small bluffs, draws, and numerous washes. The vegetation consists of creosote and other low desert shrubs ranging in density from sparse to very sparse. Much of the sand dunes themselves are denuded of any vegetative cover. The terrain provides an excellent opportunity to enjoy an outstanding ORV experience.

The area, by its very nature, consists mostly of fragile soils and, because of this, the BLM differentiates between individual ORV use and competitive ORV use. Individual use is allowed to occur with no restrictions except for those required by the Code of Federal Regulations (43 CFR 8340). These regulations mainly address safe vehicle operating procedures.

Competitive ORV use is addressed in a manner involving comprehensive stipulation and conditions which mitigate those impacts that could deteriorate the fragile soils. Although competitive events are handled on a case by case basis due to the variety of possible ORV events, in all cases, measures are instituted which allow for management to provide for a positive ORV recreational experience while minimizing the impacts to the fragile soils areas.

Presently, all competitive events are closely monitored for compliance with permit stipulations, but due to a limited staff, the monitoring of resources and individual ORV use is done only periodically.

*** Considering this is a heavy ORV use area (see Visitor Use - BLM - Off-Road Vehicles), a need exists for developing and instituting a program of resource and ORV use monitoring. The

data collected could provide BLM with the information required to better manage an area which provides a large segment of the local population with recreational opportunities.

4. Red Rock Canyon Recreation Lands

From the time the Red Rock Canyon area reverted back to BLM from the U.S. Fish and Wildlife Service in the mid-1960s, BLM has taken steps to set it aside for its inherent recreational values. In 1967, approximately 61,000 acres were dedicated as the Red Rock Canyon Recreation Lands (RRCRL).

The first Master Plan was completed in 1968. A year later a Cooperative Management Agreement was signed with Nevada State Parks to pool both agencies' resources to better manage recreation in the area.

Public sentiment changed during the construction of Segment A of the Scenic Drive in 1971. Controversy sprang up over whether the Master Plan advocated too much development. Following an Environmental Impact Statement (EIS), a new Master Plan was drawn up in 1976. This plan, which is still in effect, called for less development and emphasized a full interpretive/educational program for public enjoyment. It also established management guidelines. Current and future funding requests are based on this master plan.

In 1978, the Red Rock Canyon Interpretive Plan for the RRCRL was designed. This was succeeded by the start of the Interpretive Design and Development Contract in 1979. The implementation of the Architectural and Engineering Contract began in May, 1980, with commencement of work on the Visitor Center. Completion is expected in July, 1981.

A new Cooperative Management Agreement between BLM and Nevada Division of State Parks has been signed. The agreement identifies specific management areas each agency will be responsible for.

5. Virgin River Recreation Lands

Part of the Virgin River floodplain, 4,930 acres, was designated as the Virgin River Recreation Lands in the 1970 Notice of Proposed Classification of Public Lands for Multiple Use Management (Federal Register Vol. 35 No. 187 p. 14949). A copy of the designation order is included in the Natural Areas discussion. Designation was made for the protection of habitat of interesting, rare, and unusual plants and animals. The area
*** also has a high potential for development for waterfowl and upland game birds, whose habitats are in limited supply in

southern Nevada. Low population of the surrounding area makes development in the immediate future appear unnecessary.

6. East Mohave National Scenic Area

A portion, 1.3 million acres, of the California Desert Conservation Area in the east Mohave Desert was designated by BLM as a National Scenic Area on January 16, 1981. This area's eastern boundary is the California/Nevada state border, and was highlighted for its unique botanical sightseeing values.

*** An opportunity exists to protect the integrity of the National Scenic Area by managing the adjacent area in Nevada for sightseeing values.

7. Recreation & Public Purposes Act Land Transfers

Two recreation-related R&PP applications are pending for Clark County sites outside of the Las Vegas metropolitan area. Sites within Las Vegas will not be considered because they would be for the purpose of urban recreation rather than natural resources-oriented recreation. The two pending applications are listed in Table .47-2, as well as agencies and groups that have expressed interest in filing R&PP applications with BLM.

*** There is an opportunity to coordinate with other agencies and recreation groups under the R&PP land transfer program to provide for the optimum recreation management of an area.

TABLE .47-2
Clark County

RECREATION-RELATED R&PP APPLICATIONS

<u>Case Number</u>	<u>Applicant</u>	<u>Purpose</u>
N-4202	Nevada Division of State Parks	Expansion of the Valley of Fire State Park (approxim- ately 3,000 acres)
N-7293	Nevada Division of State Parks*	Establishment of the Red Rock Canyon State Recreation Area (approximately 2,040 acres)

Several other agencies and groups have expressed interest in R&PP leases, but have not as yet filed applications. These include:

<u>Area</u>	<u>Agency/Group</u>	<u>Purpose</u>
Floyd R. Lamb State Park	Nevada Division of State Parks**	Expansion--approximately 200 acres
Rainbow Gardens	Clark County Parks and Recreation	Clark County Wetlands Park
Las Vegas Dunes	Las Vegas Mothers' Motocross Association	Motocross Track
Spring Mountains	Las Vegas Rolling Wheels	Regional Vehicle Park
Jean	SNORE (Southern Nevada Off-Road Enthusiasts)	Regional Recreation Park

* NDSP has indicated that they will withdraw this application (Meder, NDSP, personal communication, January, 1981).

** This pending application was originally attributed to the city of Las Vegas, but transferred to NDSP when the park was transferred to the state in 1977 (NDSP 1979).

D. Quality Evaluations

1. Off-Road Vehicles

Executive Order 11644 (37 CFR 2877), as amended by Executive Order 11989 and the Federal Land Policy and Management Act of 1976 (43 USC 1701), requires all public lands to be evaluated and designated for off-road vehicle (ORV) use by 1987. The designations are to be "open," "limited," or "closed" to ORV use.

Definitions of ORV, open, limited, and closed areas as given below are published in the Federal Register, Volume 44, Number 177, 15 June 1979--Part 8340--Off-Road Vehicles.

Off-Road Vehicle: any motorized vehicle capable of, or designed for travel on or immediately over land, water, or other natural terrain, excluding 1) any nonamphibious registered motorboat; 2) any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes; 3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; 4) vehicles in official use; 5) any combat or combat support vehicle when used in times of national defense emergencies.

Open Areas and Trails: designated areas and trails where off-road vehicles may be operated subject to the operating regulations and vehicle standards set forth at Subparts 8341 and 8343 of this part.

Limited Areas and Trails: designated areas and trails where the use of off-road vehicles is subject to restrictions deemed appropriate by the authorized officer. Restrictions may limit the number or types of vehicles allowed, dates and times of use, and similar matters. Limited areas and trails may be designated for special or intensive use, including, but not limited to, organized events, and may be subject to but not limited to, rules set forth at Subpart 8341.2.

Closed Areas and Trails: are designated areas and trails where the use of off-road vehicles is permanently or temporarily prohibited.

There are basically three types of off-road vehicle users. The first type of ORV user is vehicle oriented; man and machine challenging the environment (competitive racing). The second type uses his off-road vehicle as a means to an end. He has a destination or purpose for which the ORV is used as transportation to and from (hunting, camping, mineral collecting, etc.). The third type of user uses his off-road vehicle for scenic driving (sightseeing).

Off-road vehicle use is one of the primary activities of desert recreationists with all types of use, from a Sunday drive to competitive events, taking place throughout the year. Areas within a one- to two-hour drive of the Las Vegas metropolitan center receive relatively extensive ORV use, with less activity occurring as one gets further from the population center. It should be recognized that approximately 75 percent of Clark County lies within a two-hour drive of the Las Vegas metropolitan area.

*** Clark County contains hundreds of miles of dirt roads and trails suited for ORV use, as well as hundreds of thousands of acres suitable for cross-country travel. Considering the extensive use of ORVs in Clark County, the creation of ORV play areas and motorcycle trail systems parks could be considered. An ORV play area or motorcycle trail-systems park would be a designated area that would provide the ORV enthusiast with a system of trails to ride on, day-use picnic areas, possibly campgrounds, etc. The trails and other facilities provided would be maintained on a regular basis. Identification of suitable areas would take into account points of interest, proximity to population centers, sources of water, resource protection objectives, economic feasibility, etc. Motocross parks could be considered for various areas, and the feasibility study would take the above mentioned points into account. A motocross park is a closed-loop trail raceway used for competitive dirt-bike racing. The park would need to provide for a closed-loop course and spectator area, both regularly maintained.

Numerous clubs and businesses in Clark County are organized around off-road vehicles. The Southern Nevada Off-Road Enthusiasts (SNORE) have approximately 400 members and participate in racing with baja bugs, dunebuggies, and other four-wheel-drive vehicles. They hold about 10 races per year, some of which are prize money races that attract racers from out-of-state. The Motorcycle Racing Association of Nevada (MRAN) has about 500 members and participates in motorcycle racing. They hold about 20 races each year. The Las Vegas Mothers' Motocross Association (LVMMA) is an organization of about 50 mothers who sponsor motocross races about twice per month, or about 20 events per year. These motocross events attract about 100 participants each, which has been steadily increasing. The Mint Hotel sponsors the Mint 400 Off-Road Race each year. This event is considered the largest of its kind in the world, attracting 500 international participants. The High Desert Racing Association sponsors one or two off-road events each year, and is currently planning on increasing to as many as three

events. The Las Vegas 400 sponsors a professional motorcycle race annually that attracts over 100 teams from out-of-state.

The San Gabriel Motorcycle Club of District 37 of the American Motorcycle Association sponsors the "Beatty to Vegas" race held the Sunday after Thanksgiving each year. All of the above events attract many spectators (see Visitor Use).

There are four main family-oriented organizations in Clark County centered around a less competitive ORV use. These recreationists would fall into the second and third user types discussed previously. The Las Vegas Jeep Club, the Southern Nevada Landcruisers, the Vegas Valley 4-Wheelers, and the Las Vegas Bronco Club have a combined membership of about 400. Every weekend, members of the individual clubs meet at specific locations and head out into the desert to trail ride, camp, and have fun. Each club holds one or two large organized events each year. These events attract participants from other organized clubs in Arizona, Utah, and California.

The main ORV use areas in Clark County are discussed below. The Quality Evaluation numbers refer to identification numbers of these areas on the Quality Evaluation Overlays for Off-Road Vehicles.

Stateline Planning Unit

Spring Mountains (QOrv-001):

The topography of the area consists of large mountains with numerous canyons, valleys, arroyos, draws, and saddles. The higher elevations are rugged and steep. The vegetation runs from low desert shrub with yucca in the lower elevations to dense stands of pinyon-juniper and other herbaceous species at the higher elevations. Much of this area provides excellent trail and wash riding opportunities.

These mountains are currently closed to competitive events, except in the Bird Spring Range. The president of the Groundshakers Motorcycle Club has indicated that this club would like to hold a race in the portion of the range north and east of the Pahrump Highway (Folks 1980). Field observations have shown that the area is used extensively by both four-wheel-drive vehicles and dirt-bikes. The presidents of the Las Vegas Jeep Club, Nevada Public Land Users Association, Vegas Valley 4-Wheelers, and Southern Nevada Landcruisers have all indicated that the Spring Mountains are very important to their organizations and support numerous club activities (Vomacka 1980; C. Freeman 1980; J. Freeman 1980; Scarborough 1980).

In the extreme southern portion of these mountains, there are mineshafts and other mining hazards.

*** Because of terrain limitations, much of this area should be "limited" to ORV use. Since there is trailbike riding here, a "limited" designation could take into account all aspects of ORV restrictions. Most of the lower elevation in the area could be designated "open" to ORV use.

Pahrump/Sandy (Mesquite) Valley (QOrv-002): The terrain of this area is composed of a long, broad, flat valley with gently sloping alluvial fans which rise to meet the mountains surrounding it. The vegetation consists primarily of creosote and other low desert shrubs, sparse to moderate in density. Both the terrain and vegetation provide an excellent opportunity for unrestricted ORV use.

One major motorcycle race is held in this valley each year, on the busy Thanksgiving weekend.

The area is used by local recreationists for a variety of ORV activities and, based on field observation and discussion with residents, is considered an important use area by them.

*** Although this area provides excellent terrain for unrestricted ORV use, there are some areas in the valley that contain silty soil which tends to limit the ORV experience. This valley could be designated "open" to ORV use.

Red Rock Canyon Recreation Lands (QOrv-003): The topography of the area consists of sandstone bluffs, a sandstone escarpment, several steep canyons, and several springs. The top of the escarpment is comprised of a mountainous area which slopes downward toward Lovell Canyon. The eastern area is a flat, broad valley. The vegetation consists of creosote, low desert shrub, and yucca species in the eastern valley area which yields to pinyon-juniper and ponderosa pine on top of the escarpment.

This area has been designated as a recreation area and receives intensive use (sightseeing, nature photography, hiking, etc.). Off-road groups generally believe that vehicular use in this area should be restricted to designated roads because of the scenic and natural resources.

Due to unrestricted ORV use causing serious conflicts with environmental standards and other types of use, this area should be "limited" to designated roads and trails. It should be noted that the Rocky Gap Road is used by many people for scenic driving, and that it is the only main road providing access to the top of the escarpment. The president of the Vegas Valley 4-Wheelers has indicated that this road is an important trail for this club and others (J. Freeman 1980).

Las Vegas Valley (QOrv-004): The majority of the valley is an urban and suburban population center. The topography is basically a long, broad, flat valley with gently sloping alluvial fans flowing onto the valley floor. This is a densely populated area and most of it is located within the Air Quality Nonattainment Area.

Use conflicts exist in the form of ORV use on private property, air quality standards, and noise abatement.

*** Public safety and user conflict issues necessitate that all public lands located in the Air Quality Nonattainment Area be "limited" to ORV use. The Nonattainment Area is the area where total suspended particulates, or dust, exceed both the Federal and State maximum standards. For this reason, Clark County feels that competitive off-road events within this area should not be allowed. Those portions of the valley outside the Nonattainment Area but near the suburban centers, could also be "limited." Portions of the valley falling in neither of the above could be designated "open."

*** Jean-Ivanpah Valley (QOrv-005): The topography of this area consists of a broad, flat valley with two playas, and gently sloping alluvial fans. There are low rolling hills scattered about and the vegetation consists of creosote and other low desert shrubs in a sparse density. The terrain readily lends itself to unrestricted ORV use.

Some pits and mineshafts occur here. Conflicts sometimes occur between the Goodsprings, Nevada residents and competitive ORV racers. Utility and transmission line rights-of-way hamper ORV activity on Roach Dry Lake.

Seven competitive events were held in the Jean-Ivanpah Valley area in 1979. Both dirt-bikes and dune buggies race here. It is considered an important use area by local ORV enthusiasts. The Las Vegas Jeep Club considers it a very important area and uses it often (Vomacka 1980). Field observation indicates that the valley is extensively used by individual trailbike and four-wheel-drive vehicle recreationists.

*** This area provides much of the terrain variety desirable for ORV activity, and could be designated "open" to ORV use. Competitive events near Goodsprings should be carefully managed. All hazards should be identified, marked, or removed.

Las Vegas East (QOrv-006): (Includes the eastern portion of the Las Vegas Valley, the Las Vegas Dunes, and into the Gale Hills.) The vegetation here is low desert shrub in a very sparse density and the topography consists of low, rolling hills with arroyos and bajadas. The terrain is ideal for unrestricted cross-country ORV travel.

Over four competitive events are held in this area each year, and field observations indicate that individual ORV use is extensive. The program coordinator for the Southern Nevada Landcruisers has stated that this area is very important to this club's activities (Hensley 1980). The Las Vegas Dunes ORV Play Area lies within this limit.

*** Considering the ideal terrain features and proximity to Las Vegas, this area could be designated "open" to ORV use. All hazards should be identified, marked, or removed.

McCullough Mountains North(QOrv-007): The terrain is mountainous and the vegetation consists of low desert shrub. This part of the McCullough Range is comprised primarily of lava and does not readily lend itself to unrestricted ORV use. Due to the terrain's inhospitality to ORVs, it remains relatively undisturbed and part of the area is a Wilderness Study Area. Vehicle use is restricted by terrain primarily to roads, trails, and washes.

The area is used both by four-wheel-drive vehicles, which remain mostly on roads and in washes, and by dirt-bikes, which use much of the area for trail riding. The current MFP restricts competitive use here, but the president of the Southern Nevada Jackrabbits Club has stated that portions of these mountains are suitable for racing, and he would like to see them "opened up" (Welch 1980).

There appear to be no compelling resource needs restricting ORV use here. This area could be designated "open" to ORV use in the lower elevations and "limited" in the higher elevations.

McCullough Mountains South (QOrv-008): The topography consists of mountains with canyons, small valleys, arroyos, draws, and saddles. The vegetation is creosote, low desert

shrubs, and yucca at the lower elevations with pinyon-juniper and fir at the higher elevations. At the higher elevations the terrain naturally restricts much of the ORV use to roads, trails, and washes.

There are numerous trails in these mountains that are used for trailbike riding. The president of the Gamblers Motorcycle Club has stated that this area is an important trailbike riding area (Maichle 1981), and the president of the Vegas Valley 4-Wheelers considers this area important to that club's activities, also (J. Freemon 1980). The MFP currently guiding management of this area does not allow competitive events here. There is, however, interest in holding one or two competitive events in the area, according to the president of the Groundshakers Motorcycle Club (Folks 1980).

This is one of the few areas in southern Nevada that contains fir and dense stands of pinyon-juniper.
*** Considering the terrain limitations here, the higher elevations could be designated "limited" to ORV use, and the lower elevations could be designated "open" to ORV use.

Castle Mountains/Crescent Peak (QOrv-009): The topography of the area consists of mountains with small valleys, canyons, draws, bajadas, and washes. The vegetation is comprised of creosote and other low desert shrub intermingled with yucca at the higher elevations. The terrain offers a limited opportunity for unrestricted ORV travel, and provides excellent terrain for trailbike riding.

There is currently one motorcycle competitive event annually in each of these two areas. Field observations indicate that there is extensive ORV activity in these mountains. Trails in the area are used for scenic driving and for access. The presidents of the Las Vegas Bronco Club and the Vegas Valley 4-wheelers have stated that these areas are important ORV recreation areas, for their club members and for other individuals (Hammer 1980; J. Freemon 1980).

*** These areas could be designated "open" to ORV use.

Eldorado Valley (QOrv-010): The topography of this area consists of a very broad, flat valley with a playa, and gently sloping alluvial fans. The vegetation consists of creosote and other low desert shrubs in a sparse density.

Eight or more competitive events are held in this valley annually. Field observation indicates there is extensive ORV use here. The area is ideal for ORV use, as it provides the ease of movement and terrain variety needed for *** unrestricted ORV use. This area could be designated "open" to allow for unrestricted ORV use. All hazards should be identified, marked, or removed.

Eldorado Mountains (QOrv-011): This mountainous area consists of small mountains, rolling hills, canyons, arroyos, draws, valleys, and saddles. The vegetation consists primarily of creosote, other low desert shrub, and in the higher elevations, yucca species. The terrain in the higher elevations is not conducive to unrestricted ORV use. In the lower elevations the terrain provides very good opportunities for cross-country ORV travel.

These mountains are used for competitive motorcycle events (eight in 1979), and field observation indicates that the area is used extensively by trailbikes and four-wheel-drive vehicles. The president of the Vegas Valley 4-Wheelers has stated that these mountains are important to his club and that the area is visited frequently by numerous individual users (J. Freemon 1980).

There are mineshaft hazards in the area and many have been fenced. Miners in this area attempt to restrict ORV use by erecting "No Trespassing" signs and at times physically confronting recreationists.

*** The area north of the Nelson Road (State Route 60) provides very good conditions (i.e., terrain variety) for unrestricted ORV use and could be designated "open." The area south of the Nelson road could be considered for both "limited" and "open" ORV designation. Restrictions on ORV use could take into account user conflicts, seasonal restrictions, types of vehicles, number of vehicles, and elevation restrictions, among others.

Piute Valley (QOrv-012): The topography of Piute Valley consists of a very broad, flat valley, with gently sloping alluvial fans, and some low, rolling hills. The vegetation is low desert shrub in a sparse density. The topography and vegetation are ideal for unrestricted cross-country ORV use.

Competitive events are held in Piute Valley, usually motorcycle races. Three events were run in 1979, and field observation indicates that the area receives extensive individual ORV use, both by sightseers and recreationists travelling to remote locations.

*** Piute Valley provides excellent terrain for ORV use and could be designated "open."

Newberry Mountains (QOrv-013): The topography of the area consists of mountains, small valleys, canyons, draws, bajadas, and washes. The vegetation at the lower elevations consists of creosote and other low desert shrub. At the higher elevations, the vegetation is comprised of desert shrubs, yucca, and pinyon-juniper. The density of the vegetation runs from sparse to moderate. Although the terrain is not conducive to unrestricted ORV travel, most of the area provides excellent terrain for trail riding.

Over three competitive events are held in the foothills of the Newberry Mountains each year. The president of the Gamblers Motorcycle Club has indicated that the entire area is important for trailbike riding, and could be a good racing area (Maichle 1981). The current MFP does not allow races here, however, several organizations have expressed strong interest in holding competitive events in this area. Such use could at least be allowed on roads, trails, and washes. Field observations indicate that there is quite a bit of ORV activity in these mountains, especially in the forms of scenic driving and trailbike riding.

*** This area could be considered for an "open" designation in the lower elevations and "limited" in the higher elevations.

Virgin Valley Planning Unit

Las Vegas Range (QOrv-101): This area is a thin strip of land that borders the Desert National Game Range. The topography of the area consists of a flat valley area and a small area of rolling hills and draws that comprise part of the foothills of the Las Vegas Range. The vegetation is comprised of creosote and other low desert shrub. The terrain and vegetation are conducive to unrestricted ORV travel.

No competitive events have yet been held in this area, but it is used by individual ORV enthusiasts. The Southern Nevada Landcruisers have indicated that this area is used by their club for various activities (Hensley 1980).

Use conflicts occur when unrestricted ORV travel occurs in the Desert Game Range, which is designated "limited" to existing *** roads. The BLM administered portion of the Las Vegas Range could be designated "open" to ORV use and consideration could be made for protecting the integrity of the wildlife refuge boundary.

Meadow Valley Wash (QOrv-102): The topography of the area consists primarily of a large wash. It is excellent for ORV use, lending itself to cross-country travel due to evenness of terrain, lack of large rocks on the soil surface, sandy soil, and a general vegetation density that allows for ease of movement.

One competitive motorcycle event occurs here each year and is considered an important race by local motorcycle racers. The Nevada Public Land Users Association, Vegas Valley 4-Wheelers, and Southern Nevada Landcruisers feel that this area is important to them for access and play purposes.

*** This area is outstanding for ORV use because it provides the terrain variety and ease of movement required for unrestricted ORV activity. Where ORV use does not conflict with private lands, fences, and the Indian Reservation, that area could be designated "open" to ORV use.

Arrow Canyon Range (QOrv-103): The topography consists of steep, rugged mountains with canyons, arroyos, draws, and bajadas. The vegetation is creosote and other low desert shrub. Although this area lies in proximity to the metropolitan area of Las Vegas, much of it receives low ORV use due to the restricting terrain features.

Field observations indicate that some individual ORV use occurs here. The Southern Nevada Landcruisers and the Vegas Valley 4-Wheelers have stated that parts of this range are important to their clubs (Hensley 1980; J. Freemon 1980). Arrow Canyon itself is considered important for ORV scenic driving. Two or three competitive events that are considered important by the ORV clubs, occur in this area each year. The current MFP restricts competitive use in much of the area, but the clubs feel that a good portion of the area is suitable for racing and would like to hold races here.

*** The area contains lands well suited for ORV use, although the mountainous area doesn't lend itself to unrestricted ORV use. Consideration could be made for designating portions of this area "open" to ORV use while possibly "limiting" other parts, depending on the ruggedness of the terrain.

Dry Lake Valley (QOrv-104): The terrain consists of a broad, flat valley with a playa and gently, sloping alluvial fans. The vegetation is low desert shrubs in sparse density.

Dry Lake Valley is an important area for ORV competitive events. The famous Mint 400 race is held here each year, as are several motorcycle and dunebuggy races. Field observations indicate that the area is used extensively for ORV activities, by both dirt-bikes and four-wheel-drive vehicles.

*** This area lends itself to unrestricted ORV travel and could be designated "open."

Overton Corridor (QOrv-105): The topography of the area is a flat valley with some rolling hills. The vegetation consists of sparse creosote and other low desert shrubs.

This is a populated area with the vast majority of land being private or state owned. Conflicts occur between ORV users and residents, and because of trespass on private land.

Due to this corridor being a populated farmland and private residence area, and the confusion over boundaries between public and private lands, this area could be designated "limited" to ORV use.

Muddy Mountains (QOrv-106): The topography consists of mountains with steep, rugged peaks, valleys, arroyos, canyons, draws, bajadas, and saddles. The vegetation is primarily creosote and other low desert shrub with yucca at the higher elevations. The vegetation is sparse. Much of the terrain limits ORV travel to existing roads, trails, and washes.

Field observations indicate that individual ORV use in this area is extensive. Representatives from the Southern Nevada Landcruisers, Las Vegas Jeep Club, Vegas Valley 4-Wheelers, and Las Vegas Bronco Club have all stated that this area is important to them for club activities (Hensley 1980; Vomacka 1980; J. Freemon 1980; Hammer 1980). Current MFP decisions have closed much of this area to competitive events, however, representatives of SNORE, the High Desert Racing Association, the Groundshakers Motorcycle Club, and the Charger's West Motorcycle Club have indicated that they would like to see the Muddy Mountains "opened" to competitive racing (Vaughn 1980; Lott 1980; Folks 1980; Hansen 1980).

Although much of the terrain restricts ORV travel, there are many areas which provide terrain suitable for trailbike riding. The area also contains numerous roads, trails, and washes which provide an enjoyable ORV driving experience. This area could be available for all types of recreational

ORV use including competitive events. This area could be considered for partially "open" and partially "limited" ORV use designations.

Foothills of Muddy Mountains (QOrv-107): The topography of the area consists of low rolling hills, arroyos, draws, and saddles. The vegetation is creosote and other low desert shrub in a sparse density. The terrain and vegetation provide an outstanding opportunity for cross-country ORV use.

Field observations indicate that this area is used extensively by various types of ORVs. It provides important access to the Muddy Mountains and opportunities for enjoyable trailbike riding.

There are few ORV-related conflicts occurring here. The lands located in this area are suitable for unrestricted ORV use and could be designated "open".

Mormon Foothills (QOrv-108): The terrain is a flat mesa top which runs into rolling hills, rising to meet the steep Mormon Mountains. There are many arroyos, draws, and saddles in the area. The vegetation consists of creosote and other low desert shrubs in a sparse density. The terrain and vegetative characteristics lend themselves to cross-country ORV travel.

Field observations indicate that the foothills are used by ORVs for both play and access. The Gamblers Motorcycle Club has identified this area as an important access route to the Mormon Mountains (Moichle 1981).

*** This area could be designated "open" to ORV use except along the mesa "edges," which should be designated "limited."

Mormon Mesa (QOrv-109): The topography consists of a flat mesa top and the vegetation is creosote and other low desert shrubs. The terrain of the mesa provides an excellent opportunity for cross-country ORV use.

Field observations indicate that this area is used by ORVs for play purposes. No competitive events have occurred here because the current MFP restricts them. However, MRAN has stated that it would like to hold a motorcycle race here in the future.

*** There are few, if any, conflicts existing in this area between ORVs and other users. This area could be designated "open" to ORV use because of its ideal ORV conditions.

Virgin Mountains (QOrv-110): The topography consists of steep, rugged mountains with canyons, arroyos, and draws. The vegetation consists of creosote and other low desert shrubs at the lower elevations, and pinyon-juniper, pine, and fir at the higher elevations.

There is evidence of extensive ORV use in these mountains. Field observations have also indicated that local residents use this area for trailbike riding and other recreational activities requiring ORV use. The Vegas Valley 4-Wheelers and other groups have stated that this area is important for many types of activities (J. Freemon 1980).

In the lower elevations, the land is suitable for ORV cross-country travel and excellent for trailbike riding. The higher elevations do not readily lend themselves to unrestricted ORV use. The lower elevations could be designated "open" because of terrain suitability, while the higher elevations could be designated "limited" because of the terrain limitations. When considering a "limited" designation, thought should be given to the potential for trailbike riding.

Gold Butte (QOrv-111): The topography of this immense area consists of mountains, rolling hills, valleys, arroyos, canyons, draws, and washes. The vegetation runs from creosote with other low desert shrubs in a sparse density, to pinyon-juniper and joshua tree in a moderate density. The majority of this area is ideal for cross country ORV travel.

Field observations show the Gold Butte area receives extensive ORV use. Many isolated areas can be reached by ORV and the area abounds in trails. The Southern Nevada Landcruisers, Las Vegas Jeep Club, Vegas Valley 4-Wheelers, Gamblers Motorcycle Club, and Las Vegas Bronco Club have all stated that Gold Butte is an important area used by their members (Hensley 1980; Vomacka 1980; J. Freemon 1980; Maichle 1981; Hammer 1980). The current MFP restricts competitive events in this area, but MRAN has stated that it would like to sponsor a competitive event here.

Mining occurs in portions of this area and conflicts arise in the hazards present such as mineshafts, private lands, etc.

Most of this area contains thousands of acres of land highly suitable for unrestricted ORV use and these areas need to be identified and designated as "open" to ORV use. In areas where hazardous terrain limits ORV travel, a "limited" designation could be made.

2. Horseback Riding

Horseback riding is generally associated with an urban area or an area of attractive natural resources, such as the Spring Mountains. Ease of access is a critical factor. As a result, the majority of riding in Clark County is within a short trailer ride from local stables.

Some 40,000 horses in the county are used by individuals or members of the numerous equestrian clubs. According to the 1977 Nevada SCORP (Statewide Comprehensive Outdoor Recreation Plan) horseback riding is predominantly a day use activity. Any overnight camping is usually associated with a club-sponsored trail ride.

Popular equestrian areas in Clark County include the Las Vegas Valley (particularly the Las Vegas Wash), the Spring Mountains, the Tule Springs area, and the lands around outlying communities such as Overton, Henderson, and Boulder City.

Stateline Planning Unit

Las Vegas Valley: This area supports the most concentrated equestrian activity in the county. The terrain consists of flat valley bottoms, rolling hills or badlands, and large sand washes, all of which are conducive to riding. Most use starts either directly from a stable or after a short drive on a paved road.

One of the principal riding regions consists of Las Vegas Wash, Sunrise Mountain, and East Las Vegas. This area is served by Horseman's Park and by residential stables. For a description of the extensive equestrian trail network proposed for this area, see the Clark County portion of the Recreation Sites section.

Other popular riding areas like Sunset Park are also served by both residential and commercial stables. The massive *** drainage system of the Las Vegas Valley provides a natural interconnecting trail web which could be improved.

The Las Vegas Valley is an intermixed assortment of private land, county land, and public land managed by various federal agencies. To minimize confusion and user conflicts, as well as to maximize the opportunities, there is an *** opportunity for the various landholders to cooperate in equestrian management.

Spring Mountains: The Spring Mountains provide a wide variety of riding opportunities. This area offers pine

trees, multi-colored cliffs, a cool climate, and other desirable features. The two main riding areas are Kyle Canyon, and the RRCRL and surrounding lands.

There are two rental stables which facilitate use. The Mt. Charleston Stable in Kyle Canyon is tied into numerous dirt roads and washes, as well as the adjacent National Forest lands. Bonnie Springs in the RRCRL is surrounded by open public land. The RRCRL master plan outlines an extensive equestrian trail network, complete with horse staging areas which would tie into Bonnie Springs, the Red Rock Summit Road, Lovell Canyon, and other popular riding areas. (A staging area is a hub from which riding begins. Facilities might include trailer parking areas, maps and information boards, water, and toilets.) Construction of at least a portion of this trail system should begin in the fall/winter of 1981.

An annual 50-mile marathon horse race is sponsored by the Las Vegas Distance Riders on two established routes in the Red Rock Canyon, Lovell Canyon, Cottonwood Valley, and Mt. Potosi areas.

Tule Springs/Floyd R. Lamb State Park: This area possesses numerous washes, dirt roads, water, and other desirable riding features. It is within easy riding distance from North Las Vegas. Its value will increase considerably if the proposal to open the stables at Floyd R. Lamb State Park to the public is carried through.

Outlying Communities: Horseback riding is one of the most prevalent recreation activities on the lands surrounding outlying communities, such as Henderson, Boulder City, and Overton. Stables are situated on the outskirts of these towns, facilitating equestrian use on the adjacent public lands.

Riders within the urban area, particularly in the Las Vegas Valley, at times experience safety problems due to conflicts with other users. Paved road crossings are often hazardous, such as at Lake Mead Boulevard, and Nellis Boulevard. Noise and cohabitation conflicts exist with desert motorcycles in the Las Vegas Wash and Rainbow Gardens area.

The 1977 SCORP states that not enough areas exist where a choice of trail experiences are available from one central staging area. Clark County is planning for the Las Vegas Wash and Horseman's Park area to fulfill such a need. Kyle Canyon, the RRCRL, and possibly Tule Springs could also support such staging areas. The SCORP notes a proposed equestrian/hiking trail from RRCRL through

Las Vegas, Henderson, and Boulder City to Lake Mead, as well as one from Stadium Park (Las Vegas Wash area) down the Las Vegas Wash to the Las Vegas Bay. Equestrian trails could be constructed in RRCRL, some twenty to thirty miles long with associated facilities such as picnic sites, water, and a trail register. The established 50-mile marathon course there could be marked to make it more easily identifiable.

*** Specially-marked routes with signs could be considered at dangerous equestrian road crossings. Public education efforts could reduce conflicts between equestrians, ORV users, and other recreationists.

3. Hiking

Generally hikers are attracted to areas with unusual or interesting topography, wildlife, or solitude. Ease of access, availability of drinking water and climate are often limiting or enabling factors.

Several factors limit hiking in Clark County. The harsh desert environment and relatively monotonous valleys of the Basin and Range Province concentrate the majority of hiking in the cooler and more diverse mountain ranges. Furthermore, the highly mechanized Las Vegas population often prefers to traverse the vast southern Nevada desert by vehicle rather than on foot.

Other than in a few areas of concentrated use, such as the Spring Mountains, Muddy Mountains, and the McCullough Range, hiking activity is extremely dispersed. It can occur almost anywhere in the county and often takes place in conjunction with nature study, photography, bird watching, and other recreation activities.

Stateline Planning Unit

Spring Mountains: This range is the most popular BLM-managed hiking area in Clark County. Forests, a cooler climate, a variety of plant life, and occasional springs and creeks attract recreationists. The higher elevations offer snow-climbing throughout much of the year.

Red Rock Canyon Recreation Lands (RRCRL): Colorful sandstone bluffs, rugged canyons containing water and relatively lush vegetation, and proximity to developed recreation areas are key features of the RRCRL.

This portion of the Spring Mountains offers the only developed BLM trails in the planning unit. These trails connect the Calico Vista, Pine Creek Overlook, and the

undeveloped Lost Creek trailhead with nearby canyons. A loop trail through a cactus garden and along the Red Rocks Wash serves hikers at Willow Springs. There are also several well-worn footpaths. Hiking use within the RRCRL is moderate to heavy.

McCullough Mountains--North: The main attractions of the North McCulloughs are unspoiled vegetation and the thousand-foot drop of the black lava cliffs. Hiking activity is light.

McCullough Mountains--South: This range supports large stands of pinyon and juniper trees, and offers impressive views from McCullough Mountain. Hiking use is light.

Virgin Valley Planning Unit

Muddy Mountains: This range adjoins and complements hiking areas in Valley of Fire State Park and Lake Mead NRA. Hiking is enhanced by the colorful rock formations and archeological sites of Buffington Pockets and Hidden Valley, the impressive pinnacle and spectacular erosion of Muddy Peak, and the dramatic cliffs of the Gale Hills. Hiking activity is light to moderate.

The principal use conflicts experienced by hikers are lack of access, ORV activity, shooting, encroachment by development, mining, and oil and gas exploration.

*** There are opportunities to enhance the hiking resource by constructing trail networks. Demand for this would be primarily in the Spring Mountains. The RRCRL master plan identifies a variety of trail routes. This system is in the design phase and construction should begin in 1981.

Additional trails tying into the U.S. Forest Service trails system could be considered. Examples are connecting 1) the RRCRL to the Charleston Peak Trail, 2) Cold Creek/Willow Creek to the Camp Bonanza Trail, and 3) Mt. Stirling to the Camp Bonanza Trail (Gardner, USFS, personal communication, 1980).

4.a. Sightseeing-Geological

Geological sightseeing is very common in the desert because there is little vegetation or soil to hide the underlying rock formations. The oftentimes brilliant colors of sandstone and limestone formations can be easily seen and traced from one area to another. Perhaps this makes geology one of the most notable features of Clark County. Photographing and observing these features combine readily with numerous other recreational

activities such as rock-hounding, camping, hiking, and off-roading.

*** Enhancement of geological sightseeing could be accomplished through identification of unique areas by completion of the scenic quality ratings, which are part of the Visual Resource Management (VRM) Program. Once these outstanding areas have been identified, interpretive brochures and maps could be compiled and published. Consideration could be made for the development of interpretive hiking trails and vehicle routes through the areas.

Stateline Planning Unit

Red Rock Escarpment, Calico Hills, Brownstone Canyon, and La Madre Mountains (QSgo-001): Red Rock Escarpment consists of buff and red sandstone which rises almost vertically for 2,000 feet over most of its seven-mile length. The colors occur in bands of various widths. The escarpment is dissected by several deep and narrow canyons which contain streams and waterfalls part of the year.

The Calico Hills appear quite different from the nearby escarpment--orange, purple and, brown, as well as shades of white and tan color the rounded and much softer shaped hills and ridges.

La Madre Mountain's sheer face is banded with shades of gray and its angular lines contrast vividly with the rounded sandstone below. An "event" of great interest to geologists is visible by climbing up the rocks just above Brownstone Reservoir and walking uphill until one observes gray and orange rock fragments underfoot. This is the Keystone Thrust Fault where a tremendous upheaval placed the ancient gray limestone, now called La Madre Mountain, on top of the relatively young sandstone formation.

These areas, as part of Red Rock Canyon Recreation Lands, are major recreation areas for southern Nevadans and problems exist with littering, vandalism, over-use, and fire.

*** Interpretation of these areas could be included in plans for developing the RRCRL, with the possibility of trails leading to semideveloped campsites or day-use facilities.

Frenchman Mountain, Rainbow Gardens (QSgo-002): The Frenchman-Rainbow area is of great interest to geologists because it apparently lies on the edge of one of the earth's giant crustal plates. The small, approximately 2-mile-square area also contains most of the geologic story represented by the Grand Canyon, Zion, and Bryce National

Parks combined. This area contains the best developed and most easily visualized faulting in southern Nevada.

Professional interest in the area is further evidenced by the number of textbooks and studies which discuss the phenomena visible here. The University of Nevada, Las Vegas, asked the BLM to set the area aside ten years ago for use as an outdoor geology lab and recreation area. With the Navajo-McCullough powerline now traversing part of Rainbow Gardens, some of the scientific values have been destroyed (delicate electronic instruments will not function near the powerline). However, both professional and casual interest in the area remains high-- the university is still concerned about the area, and Clark County would like to include Rainbow Gardens in their proposed Wetlands Park. ORV groups would like the area to remain open to individual use.

HCRS has determined that the area is a potential National Natural Landmark; its designation awaits the decision of the BLM to manage it accordingly.

Currently, the area is abused through trash dumping, unchecked ORV use, and "target" shooting. In addition, mining claims exist there, and the area has been identified as a utility corridor for the Harry Allen-Warner Valley Project as well as for the Rocky Mountain Gas Pipeline.

*** Opportunities in the Frenchman-Rainbow area are numerous. Designation as a National Natural Landmark would not preclude its use for other purposes, but would enhance its recreational and educational values. Because of its urban characteristics, the area could be leased to the county for inclusion in the Wetlands Park. Development of day-use facilities such as picnic areas, restrooms, interpretive trails and exhibits, and parking areas could be considered. Greater management protection could be utilized to reduce the problems currently present.

McCullough Mountains--North (QSgo-003): This range rises abruptly from the dry lake bed below on the east, while on the west it rises more gradually. It is volcanic in origin with excellent examples of lava flows, ash falls, and glassy zones. The range is characteristic of those found in the Great Basin and is part of a transition zone between the Mohave-Sonoran Desert Region and the Great Basin.

Developments such as powerlines and roads occur in the lower elevations.

- *** Consideration could be made for the development of an interpretive trail system here.

Keyhole Canyon (QSgo-004): This canyon is an excellent example of what can result when granite intrudes into softer rock, followed by differential erosion. The resulting small canyon is a cool and shady oasis.

Problems in this area arise in the form of littering and vandalism of the rock art found here.

- *** This canyon could be patrolled more frequently and consideration could be made for the minor development of sites for day use.

Gregory's Arch (QSgo-005): Located one and a half miles north of Nelson, this arch is a small natural bridge about 12 feet high and 15 feet across, spanning the drainage that becomes Techatticup Wash. The bridge spans a scenic portion of the streambed where pockets and alcoves have been eroded into the quartzite walls. Beneath the bridge, dense vegetation, mostly desert shrubs, rises from a seep spring.

No use conflicts are known to occur here.

- *** A potential exists for developing an interpretive trail to the arch where day-use facilities could be erected.

Newberry Mountains (QSgo-006): These mountains have quite a strange appearance. The rocks are blackish-brown and many of them have weathered into spheroidal shapes. Composed of metamorphic rocks intruded with granite, this is another classic area often studied by geologists.

Few use conflicts arise here.

- *** Periodic patrols could enhance visitor and resource management of the area. Cooperative patrol agreements could be established with the National Park Service, which sends rangers through the area regularly.

Virgin Valley Planning Unit

Arrow Canyon Range (QSgo-101): Arrow Canyon Range offers spectacular examples of faulting and sedimentary deposits. It is considered a good example of Basin and Range features.

No known use conflicts exist.

Arrow Canyon (QSgo-102): The stratigraphy of the Paleozoic carbonates is exposed on a bed by bed relationship. Even to the novice it is obvious that the geologic structure is

unique. In a short distance, it is possible to see a tremendous variety of rock layers. At the eastern mouth of the canyon the walls close into almost vertical cliffs as close as 20 feet at the bottom and reaching 300 to 400 feet in height.

Conflicts occur in the form of indiscriminate ORV use and vandalism of the canyon's archeological features. Arrow Canyon is one of only a few areas attractive both to ORV groups, including racers, and to recreationists seeking quiet solitude in the desert.

- *** The area could be patrolled routinely to provide for adequate resource management. An interpretive trail system could be developed.

Muddy Mountains (QSGO-103): This area is located 15 miles northeast of Las Vegas. The area contains many outstanding geologic features. Bright red and yellow outcrops of sculptured sandstone occur in profusion. In Buffington Pockets most of the colored rock occurs on the west side of a secluded, strongly defined valley.

A fenster, or window through a major thrust fault, is the outstanding geologic feature. The Paleozoic carbonates, a dark gray mass of bedded and distinctly layered ancient sediment, have moved laterally and essentially horizontally along the Muddy Mountain thrust. Erosion has carved through this gray cap and exposed younger red and white sandstones.

Potential use conflicts exist in the form of mining interests in the area.

- *** Considering the proximity to Las Vegas, an opportunity exists for development of this area for picnicking and winter camping.

Weiser Bowl (QSGO-104): The area is located 5 miles south of Glendale. The Weiser Bowl is an oval depression. The regular succession of layers in its floor and walls shows that it is cut into essentially horizontal strata. The bowl contains an excellent range of colors running from light to rich red sandstone. Its geological significance is structural in nature, as the bowl is carved from a nearly horizontal succession that is upside down. This bowl offers excellent exposure and is not only the best example of an upside down fold in southern Nevada, but one of the best in the United States. The area has been nominated for National Natural Landmark status, and is under review by HCRS.

Prospecting for gypsum occurred long ago on the rim of the bowl, but there is currently no known mining interest in the area.

- *** BLM could support HCRS in their natural landmark studies of the area, or initiate a designation action of its own.

Mormon Mesa (QSgo-105), Flat Top Mesa (QSgo-106): Mormon Mesa is a large triangular shaped mesa bounded by the Muddy and Virgin Rivers. Underlaid by cemented soils, the horizontal mesa is highly resistant to erosion. Side canyons incise the margins, creating scenic views of tertiary geology. Flat Top Mesa is considerably smaller, but otherwise, identical to Mormon Mesa.

Mesas are very uncommon in the Basin and Range Province and there is no other within at least a half-day drive.

Use conflicts arise in the form of roads which cut into the edges of the mesas.

Mormon Mesa was recently dropped from consideration for National Natural Landmark designation by HCRS.

Whitney Pocket (QSgo-107): The term "pocket" means a low-lying area where surrounding rock has been removed, often exposing an under lying layer or portions of it. At Whitney Pocket, large outcroppings of Aztec sandstone, the largest almost clifflike, rise dramatically from the desert floor. The rocks have been sculptured by wind and rain, leaving hollows, overhangs, and enclosures. A spectrum of red and white colors the rocks.

This area is used for camping and day-use. Trash is occasionally present.

- *** This area could be considered for development of day-use and overnight camping facilities. Resource and use monitoring patrols could be instituted.

Red Bluffs (QSgo-108): This area is located about 25 miles southeast of Mesquite and about 5 miles west of Whitney Pocket.

Tilted Jurassic and Triassic sandstones and shales in deep shades of red are well exposed, creating a view not unlike that in the Valley of Fire. Mudcracks, ripple marks, and cross-bedding contribute to the geologic scene. A spring provides a good example of how bedrock and rock fractures result in spring formation.

There are no known use conflicts.

*** Overnight camping and day-use facilities could be considered as an enhancement possibility.

Devil's Throat (QSGo-109): This sinkhole is located approximately 30 miles south of Mesquite.

Devil's Throat is a sinkhole 80 feet across and 100 feet deep caused by the subterranean collapse of a limestone cavern.

There is a slight litter problem here.

The hole has been fenced by BLM. An interpretive signing program for the site could be instituted.

Mud Hills (QSGo-110): These hills are located 30 miles south of Mesquite. They are round and softly shaped, and the colors are brilliant red contrasting with dark gray.

No known use conflicts occur here.

b. Sightseeing-Botanical

There are numerous areas within Clark County where one can view the various forms of specially adapted plant life that grow in the Mohave desert. Those areas considered significant are described below.

Use conflicts arise in the form of people illegally removing plants from the desert, both for private and commercial use.

*** A public education program could be developed to inform the public of the short-term and long-term effects of indiscriminate removal of plants from the desert. Areas need to be studied as to the possibility of their being designated as natural areas if they contain unique botanical features. An interpretive program could be developed involving brochures, maps, signing, etc. Interpretive trails should be considered for certain areas.

Virgin Valley Planning Unit

Arrow Canyon (QSbo-101): The area offers a fair opportunity for botanical sightseeing. There are good examples of cliff dwelling plants and the sandy canyon floor supports numerous annuals during good spring months.

Warm Springs Palms (QSbo-102): This area is located 5 miles northwest of Moapa. Although Warm Springs is private land,

it is being considered in this section because access is through public land. The area contains the only native palms known in the planning unit. Botanical sightseeing opportunities are considered good.

Anniversary Mine Area (QSbo-103): This area, within the Gale Hills, is located 40 miles east of Las Vegas. This area offers a good opportunity for botanical sightseeing. In particular, the area contains probably the best known concentration of bearpoppy. The gypsum soils support wildflowers and vegetation here that are quite different from other southern Nevada plant communities.

Virgin River Recreation Lands (QSbo-104): The area offers a fair opportunity for botanical sightseeing. Its ecosystem is primarily swampland and contains dense stands of salt cedar. This area's unique vegetation feature is the density of its vegetation, an uncommon characteristic in southern Nevada.

Conflict arises from the area containing much private land which could lead to unintentional trespass.

Virgin Mountains (QSbo-105), South Virgin Mountains (QSbo-106): These areas offer excellent opportunities for botanical sightseeing, especially the Virgin Mountains. On the north-facing slopes are scattered stands of coniferous forests which include Douglas fir, white fir, ponderosa pine, and aspen. From 6,000 feet up one can find stands of manzanita, mountain mahogany, scrub oak, white spruce, and pinyon pine. The Virgin Mountain Natural Area is located around the range's twin peaks. In the southern end of the Virgin Mountains there are many cacti, and in years of plentiful precipitation, this area has excellent wildflowers.

Gold Butte (QSbo-107): The area offers a good opportunity to view Mojave Desert plant life. In the Paradise Valley and Horse Spring Valley areas there are very good stands of Joshua trees. Wildflowers abound in years with adequate precipitation.

Stateline Planning Unit

Desert View Natural Area (QSbo-001): This area is located approximately 35 miles northwest of Las Vegas along the Lee Canyon Road. The Natural Area offers a fair opportunity for botanical observation. It provides the viewer with the

chance to observe the change of the vegetation that occurs as one travels up in elevation. Some uncommon desert plants occur in the area, including hiddenflower, Cryptantha tumulosa and a cactus, Coryphantha vivipara var. rosea. (See Management Areas - Natural Areas.)

Pine Creek Canyon (QSbo-002): Pine Creek Canyon contains a large number of plants endemic to the Spring Mountains. Botanical sightseeing opportunities are excellent. Plants rare in this part of the county occur here, including Polyspichum scopulinum, a fern not known to occur elsewhere in Nevada; and liver wort, rare to the Spring Mountains and this canyon is one of the few places where it can be found. The plant community present here has other unique features. Willows, ash, and hackberry provide a dense canopy and the stream creates a microclimate suitable for the existence of more different species of fern than occur anywhere else in the Spring Mountains. Pine Creek Canyon includes the Pine Creek Research Natural Area. (See Management Areas - Natural Areas.)

Goodsprings Area (QSbo-003), Potosi Barrel Cactus Area (QSbo-004): Both of these areas offer a very good opportunity for botanical sightseeing. The Goodsprings area contains barrel cactus, prickly pear, and some fine stands of century plant. The Potosi area contains a selection of cactus, agave, and related desert plants. The Goodsprings area also contains some very uncommon Mojave Desert plants, such as beard tongue, Penstemon bicolor.

Sunrise Mountain, Rainbow Gardens (QSbo-005): These areas also contain mostly gypsum soils and support only those plants able to tolerate the acidity. Large stands of bearpoppy occur in both areas. The western half of Sunrise Mountain Natural Area is extremely barren, due largely to overuse. Rainbow Gardens is regarded as a true desert, with vegetative growth restricted more by poor soils than by lack of water. Some excellent stands of cacti do occur in parts of this area. Botanical sightseeing opportunities are fair.

Conflicts between users occur in the form of illegal dumping, indiscriminate ORV use, and target practicing. Recreationists who might use these areas often refrain because of these unpleasant and sometimes hostile activities.

*** Resource monitoring and use supervision patrols could be initiated in this area.

Las Vegas Wash (QSbo-006): This area's ecosystem is a marsh. It contains numerous varieties of vegetation including saltbrush, salt cedar, pickleweed, and sea lavender. Opportunities for botanical sightseeing are good.

Much of the land here is privately owned and trespass occurs often. This is not a major problem as most of the private land is unoccupied and unused.

*** Clark County's regional Wetlands Park proposed for this area could be supported by BLM.

McCullough Mountains (QSbo-007): This area offers a fair to very good opportunity for botanical sightseeing. The crest of the mountains here contain typical stands of pinyon-juniper and an extensive joshua tree forest covers the flanks. There are extensive stands of black grama found here, which are not known to occur elsewhere in Nevada. Extensive stands of rare, undisturbed desert plant communities led to nomination of the entire McCullough Range for National Natural Landmark status. Final designation awaits the BLM's decision to manage the area appropriately.

*** The opportunity exists to designate all or a part of the South McCullough Range as a National Natural Landmark or as a BLM natural area.

Piute Valley Joshua Tree Area (QSbo-008): The area offers a good opportunity to observe a stand of fairly large joshua trees.

Eldorado Canyon (QSbo-009), Cottonwood Cholla Area (QSbo-010): These areas provide fair to good opportunities for botanical sightseeing. Eldorado Canyon supports a good population of teddy bear cactus, and offers the opportunity to view uncommon Mojave Desert plants, such as caterpillar weed, Phacelia anelsonii. The Cottonwood Cholla area supports an exceptional population of cholla cactus and may be worthy of a special designation.

Newberry Mountains (QSbo-011): The area offers a fair to good opportunity for botanical sightseeing. The southern portion of these mountains is the only area in Nevada where California juniper is known to occur. This area is also excellent for wildflowers in most years.

c. Sightseeing-Zoological

There are several wildlife viewing areas located within Clark County. Two of these areas, the Desert National Wildlife Range and Lake Mead National Recreation Area, are located on lands administered by other agencies. Access, however, to parts of these areas is across BLM administered lands. The two areas are considered in this section.

Generally, all of Clark County offers opportunities to view the unique variety of wildlife that dwells in the desert. The gila monster and desert tortoise occupy the vast expanses of valley floors and the lower elevations of the alluvial fans that comprise much of Clark County. Numerous raptor species occur throughout the county at various times (see Table .46-29 in the Nongame Birds discussion in Section .46, Wildlife). The larger animals, such as desert bighorn sheep, can be found in many of the mountain ranges that occupy much of Clark County.

*** Enhancement of zoological sightseeing potential more aptly belongs with the Nevada Department of Wildlife, although a BLM public education program could be developed for interpretive purposes.

Desert National Wildlife Range: Administered by the U.S. Fish and Wildlife Service, this area offers very good opportunities for observing many desert species. Desert bighorn sheep can be spotted throughout the Sheep Range, especially near springs.

Lake Mead National Recreation Area: There are good opportunities for spotting desert bighorn sheep, especially along the river edge. The Colorado River Basin provides suitable habitat for the gila monster, but this elusive creature is difficult to spot. There are also very good opportunities to spot varied species of birds as Lake Mead is a stopover on migratory routes. This area is administered by the National Park Service.

Virgin Valley Planning Unit

Arrow Canyon Range (QSzo-101): There is a fair opportunity to observe desert bighorn sheep.

Virgin River (QSzo-102): A good opportunity exists to spot waterfowl. Much of the habitat conducive to waterfowl is located on private land and conflicts could arise over trespass. The river also contains endemic and endangered fish (see Aquatic Species in Section .46, Wildlife).

Virgin Peaks (QSzo-103): The BLM and Nevada Department of Wildlife are currently transplanting desert bighorn sheep into the area. A fair opportunity exists to observe large and small mammals, such as mountain lion or mule deer.

Stateline Planning Unit

Wheeler Wash (QSzo-001): A fair opportunity exists to spot wild burros and horses.

Cold Creek (QSzo-002): There is a very good opportunity to spot wild burros and horses. A good opportunity to view a variety of wildlife exists, as this is an important water source. There are mule deer and mountain lion in the area. The entire east side of the Spring Mountain Range has been identified as a very good area for birdwatching.

Red Rock Canyon Recreation Lands (QSzo-003): There is an excellent opportunity to view many varieties of birds in the Oak Creek and Pine Creek areas of the RRCRL. A peregrine falcon observation was documented in Pine Creek in 1980. Along the escarpment, good opportunities exist to spot desert bighorn sheep, especially toward the southern portion. On the valley floors, particularly in the southern end between Bonnie Springs and the Pahrump Highway, a very good opportunity exists to observe wild horses and burros. The careful observer may also spot mule deer.

Las Vegas Wash (QSzo-004): There is an excellent opportunity to view many different varieties of birds, such as the Phainopepla, Bullock's oriole, or Black-throated sparrow. Las Vegas Wash has been identified by the local chapter of the Audubon Society as one of three significant birdwatching areas in Las Vegas Valley.

Highland Range (QSzo-005): A very good opportunity exists to spot desert bighorn sheep.

Eldorado Mountains (QSzo-006): A good opportunity exists to observe desert bighorn sheep and wild burros.

Newberry Mountains (QSzo-007): A fair opportunity exists to observe desert bighorn sheep.

d. Sightseeing-Historical

There are numerous historical sites within Clark County. History and the present blend together and become nearly indistinguishable in southern Nevada. Many old mines and mills are abandoned, but numerous others are still utilized and protected by their owners.

User conflicts exist in the form of unintentional trespass by sightseers onto private lands; vandalism and destruction of unprotected historical sites; and the removal of objects of antiquity by collectors.

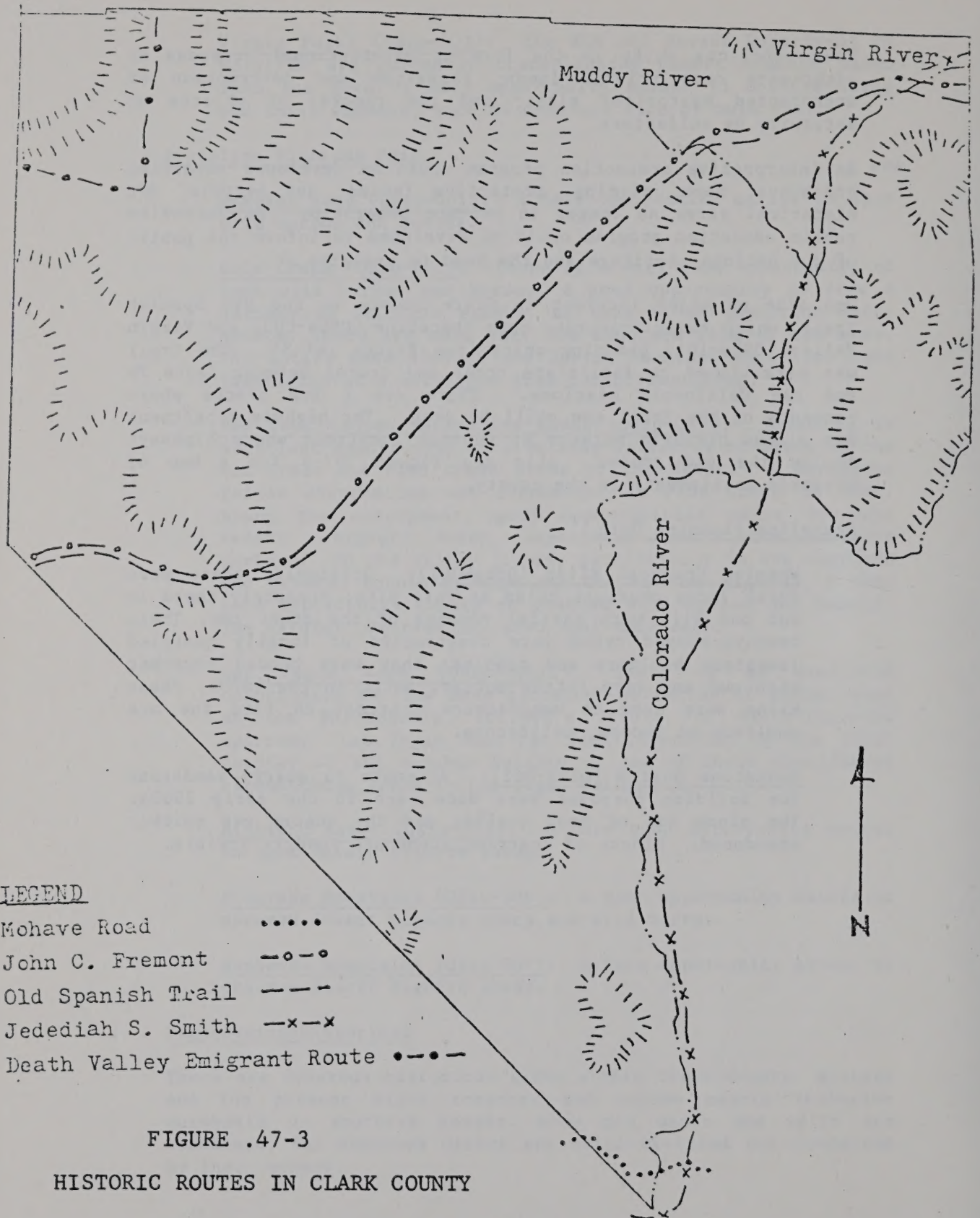
*** An interpretive protection program could be developed involving brochures, maps, signing, protective fences, and patrols, for historical sites no longer in private ownership. An intensive public education program could be developed to inform the public of our national heritage and the need to preserve it.

One site of major interest in Clark County is the Old Spanish Trail, which today traverses both Stateline (QShs-003) and Virgin Valley (QShs-101) planning units (see Figure .47-3). The trail was established to facilitate trade and travel between Sante Fe and the California missions. There are a few places where remnants of the Trail can still be seen. The highway department has placed historic markers at several locations where highways follow the old route. Also see Figure .47-4 for a map of historic settlements in the county.

Stateline Planning Unit

Wheeler Charcoal Kilns (QShs-001): Originally there were three large charcoal kilns at this site; presently there is but one kiln with partial remains of the other two. These beehive-shaped ovens were constructed of locally quarried limestone boulders and cobbles; they were bonded together with mud and very little mortar. Built in the 1870s, these kilns were used to manufacture charcoal to fire the ore smelters at Tecopa, California.

Sandstone Quarry (QShs-002): Attempts to quarry sandstone for building purposes were made here in the early 1900s. The stone was of poor quality and the quarry was quickly abandoned. Blocks of quarried stone are readily visible.

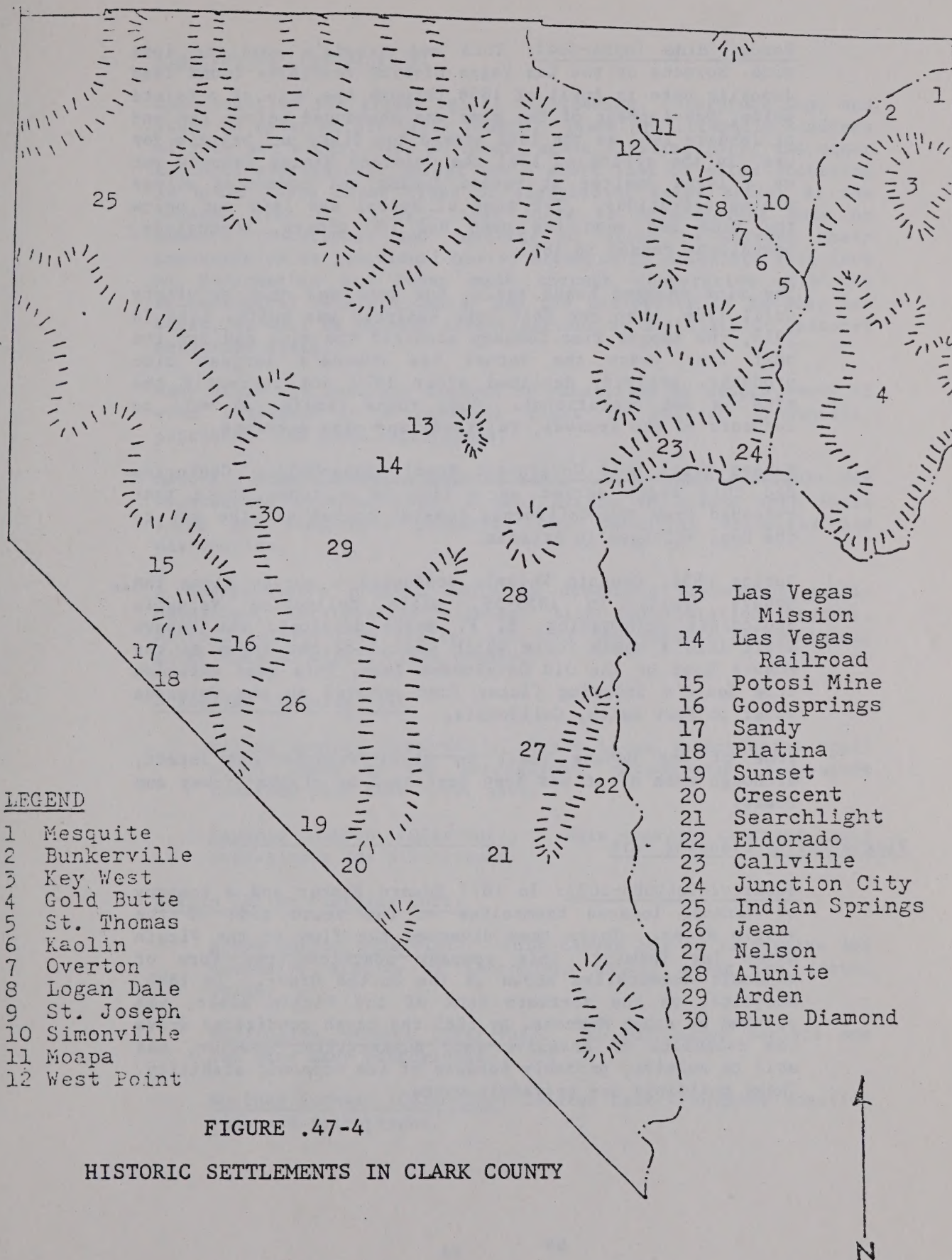


LEGEND

- Mohave Road
- John C. Fremont -○-○-
- Old Spanish Trail - - -
- Jedediah S. Smith -x-x-
- Death Valley Emigrant Route •-•-

FIGURE .47-3

HISTORIC ROUTES IN CLARK COUNTY



Potosi Mine (QShs-004): This was Nevada's earliest lode mine. Mormons at the Las Vegas Mission initially found lead deposits here in April of 1856 through the help of a Paiute guide. Development of the mine was abandoned before the end of January 1857 as the lead proved too flaky and brittle for use. In the spring of 1861 the Colorado Mining Company set up a large smelter at Potosi Spring and commenced silver mining operations. The town of Potosi was laid out below the mine and soon the camp had 100 miners. Nonetheless, operations ceased in 1863.

The mine changed hands again, but work was only desultory until 1906, when the Salt Lake Railroad was built. Late in 1913, the Empire Zinc Company acquired the mine and for the next four years the Potosi was Nevada's largest zinc producer. Activity declined after 1920 and currently the mine is not operational. Stone ruins remain, as well as remnants of the tramway, railroad, and mine entrance.

Mohave Trail (Old Government Road) (QShs-005): Centuries ago this trail served as a link in a trade route that extended from the California coastal tribes all the way to the Hopi villages in Arizona.

During 1854, Captain Whipple conducted a survey along the Mohave Trail. In 1858-59, while collecting valuable geological information, E. F. Beale developed the Mohave Trail into a wagon route which was to become known as the Mohave Road or the Old Government Road. This road extended from Beale's Crossing (later Fort Mohave) on the Colorado River to Fort Smith, California.

Some of the Mohave Trail is still visible and intact, although much of it has been destroyed by rights-of-way and roads.

Virgin Valley Planning Unit

Bunkerville(QShs-102): In 1877 Edward Bunker and a company of Mormons located themselves on the south side of the Virgin River. There they diverted the flow of the Virgin River for farming. This company practiced the form of economic communalism known as the United Order. In 1880, Mesquite, on the northern bank of the Virgin River, was settled by other Mormons. By 1883 the harsh conditions drove the colonists of Mesquite out. Bunkerville, however, was able to survive, probably because of its economic stability. These buildings are privately owned.

e. Sightseeing-Archeological

Opportunities for archeological sightseeing, interpretation, and study do exist within Clark County. There are literally hundreds of rock art sites, shelter caves, agave roasting pits, and other cultural expressions. Except for a short list of sites occurring in areas where other types of sightseeing takes place, at the present time it is felt that there is insufficient data on numbers, locations, and quantity of sites to warrant their inclusion on an individual basis. Attempts to alleviate this lack of information are being made through cooperation with the Archeological Research Center and the University of Nevada, Las Vegas, as well as through investigations by the District Cultural Resources staff.

Many sites are severely damaged or vandalized by people, many of whom consider it a personal right to collect arrowheads, potsherds, and even petroglyphs.

Before a more inclusive list of sites can be made available for sightseeing opportunities, a need exists to insure that these sites are adequately protected from potential vandalism and destruction.

*** A comprehensive program could be developed concerning public education, interpretive signing, site deterioration studies, patrol, interpretive trails, etc. for the various archeological sites located within Clark County.

Stateline Planning Unit

Willow Springs (QSar-001): There is an interpretive trail which leads to the petroglyphs, pictographs, and agave roasting pits that occur here.

Keyhole Canyon (QSar-002): This canyon contains many petroglyphs and pictographs.

Virgin Valley Planning Unit:

Arrow Canyon (QSar-101): This canyon has an impressive and extensive display of petroglyph panels along the canyon walls.

Buffington Pockets (QSar-102): At Buffington Pockets one can find many petroglyphs.

Whitney Pockets (QSar-103): Located here are agave roasting pits and petroglyphs.

f. Sightseeing-Other Cultural

This category refers to cultural features which have significant human interest value and are less than 50 years old (i.e. too recent to be considered within the "Sightseeing-Historical" section). BLM has several projects which could be of interest to the public. This would especially pertain to projects in the RRCRL, the Spring Mountains, or other high visitor use areas. Examples of activities that could be interpreted are oil and gas activities, prescribed burns, seeding or other vegetation manipulations, wildfire areas, and road closures for rehabilitation.

An example of projects that should generally not be interpreted is active mining operations. This could cause safety, trespass, or vandalism problems by attracting the general public to these sites.

*** Interpreting these projects through brochures, signing, or exhibits in the District Office or the Red Rock Canyon Visitor Center could help dispel some of the negative feelings often directed toward BLM and could help to educate the public in the values of resource management.

5. Hunting

The major hunting activities on BLM lands within Clark County are for big game, primarily desert bighorn sheep, and upland game, primarily Gambel's quail. Quail are found distributed throughout Clark County and lack of available water seems to be their only limiting factor. The desert bighorn sheep are limited to mountain ranges. Their roaming area is determined by the amount of forage available and the location of water sources.

Mule deer, chukar partridge, and cottontail rabbit are also hunted, but except for rabbit, the populations of these species are very limited and hunting is considered poor. Cottontail rabbits can be found at most elevations and in most habitat types in southern Nevada.

Waterfowl hunting occurs, but since almost all of the waterfowl occur on either private property, state administered lands, or lands administered by other federal agencies such as the National Park Service, hunting is limited.

Furbearers are limited to the desert varieties. Coyote is the most commonly observed but is not classified as a furbearer by the Nevada Department of Wildlife. It is abundant throughout all elevations and habitat types in Clark County. Bobcat is also common throughout Clark County. Kit fox is common in the valley

areas. Grey fox is common throughout the mountain ranges of Clark County.

Mountain lion occurs in limited number in the Spring, Virgin, and McCullough Mountains. Trophy hunting is licensed by the state of Nevada, but in 1980 there were no areas in Clark County open to the hunting of this species.

All hunting and trapping is regulated and licensed through the Nevada Department of Wildlife. Access to hunting areas seems to be adequate and since hunting is regulated by the State of Nevada, any opportunities for enhancement should be suggested by the Nevada Department of Wildlife.

Stateline Planning Unit

Spring Mountains (QHbg, ug-001): Good terrain variety exists, running from rugged slopes to canyons and rolling hills. There are good hunting opportunities for desert bighorn sheep and quail. Mule deer occur but the population is small and hunting is considered poor. Very low numbers of Rocky Mountain elk and wild turkey occur which severely limits the opportunity for hunting. Chukar partridge occur in the northern portion of the range but the hunting opportunity is poor.

Bird Spring Range (QHbg-002): The terrain here provides for easy movement. A fair opportunity exists to shoot a desert bighorn sheep.

Las Vegas Wash (QHug, wf-003): This area consists of wash terrain with movement restricted by vegetation. Good hunting opportunities exist for quail, fair for waterfowl. The small size of the area restricts hunting opportunities.

McCullough Range (QHbg-004): This area was not rated in the RIS because it was closed to hunting in 1979, but is included here because hunting opportunities are considered fair to good.

The terrain is rugged. Hunting opportunities for desert bighorn sheep are considered fair to good, especially in the southern portion of the range. Quail hunting is fair to good from the southwestern foothills of the South McCullough Range to the Lucy Grey Mountains. Some mule deer occur here but hunting opportunities are only poor to fair.

Highland Range (QHbg, ug-005): The terrain is rugged except in the lower elevations. Excellent hunting opportunities

exist for desert bighorn sheep and quail. Several guzzlers are located at the lower elevations.

Castle Mountains, Crescent Peak (QHbg,ug-006): These areas were not rated, but are included here because hunting opportunities do exist. Desert bighorn sheep and quail occur here and the hunting opportunity is considered fair.

Eldorado Mountains (QHbg, ug-007): The terrain is mountainous but not too rugged. Good hunting opportunities exist for desert bighorn sheep. Much of the bighorn area is located within the Lake Mead National Recreation Area. Several guzzlers are located along the foothills of this range. Good hunting opportunities exist for quail.

Nelson Area (QHug-008): The terrain consists of rolling hills resulting in little restriction of movement. There is a good opportunity for hunting quail. Numerous guzzlers are located in the area. Private lands (patented mining claims) intermingle with public land and potential for conflicts exist if a hunter trespasses onto private land.

Searchlight Area (QHug-009): The terrain is a valley area, providing for ease of movement. A good opportunity exists for hunting quail. Several guzzlers are located in the area.

Newberry Mountains (QHbg, ug-010): Restrictions on movement are caused by rugged terrain. Good hunting opportunities exist for desert bighorn sheep and quail. Guzzlers are located in lower elevations. Much of the range the bighorn sheep utilize is located inside Lake Mead National Recreation Area. Some mule deer occur here but the populations are low and hunting is considered poor.

Virgin Valley Planning Unit

Arrow Canyon Range (QHbg-101): Rugged terrain limits movement. Good hunting opportunities exist for desert bighorn sheep.

Moapa Valley (QHug, wf-102): The terrain allows for ease of movement. There are excellent hunting opportunities for quail. Waterfowl occur here but the majority of hunting takes place on private or state lands.

Muddy Mountains (QHbg-103): Movement is restricted by the rugged terrain. There is a good opportunity for shooting a desert bighorn sheep.

Virgin River (QHug, wf-104): The terrain is relatively flat. A fair hunting opportunity exists for quail. Lack of vegetation cover limits the amount of waterfowl available. Most of the waterfowl in the area occur on private lands.

Lower Virgin Mountains (QHug-105): The terrain is rolling hills and draws; movement is only somewhat restricted. Hunting opportunities for quail are fair. There are two guzzlers located in the northwestern portion.

Upper Virgin Mountains (QHug-106): The terrain here is rugged. There are fair hunting opportunities for quail. Desert bighorn sheep are currently being reintroduced into the area.

Gold Butte (QHug-107): The terrain allows for relatively easy movement. Good opportunities exist for hunting quail. Numerous guzzlers have been constructed throughout the area at lower elevations.

6. Fishing

Fishing is virtually nonexistent on BLM administered lands within Clark County. There are no lakes on BLM public lands that support populations of fish. The Lake Mead National Recreation Area, which is administered by the National Park Service, offers the best opportunity for fishing. See Aquatic Species, Harvest, in Section .46, Wildlife for information on particular species on BLM administered lands.

Stateline Planning Unit

Cold Creek and Willow Creek: These creeks are located approximately 1/2 mile from each other at the northern end of the Spring Mountains. The streams were once stocked with trout by the Nevada Department of Wildlife. Although they are no longer stocked, there is still a small population of trout in both creeks. The areas are no longer managed for fishing.

Considering that this area is heavily used and that the creeks are relatively small, there appears to be no opportunity for enhancement that is economically feasible.

Virgin Valley Planning Unit

Virgin River: Most of the lands within Clark County bordering this river are private. The limited area along the river that is public lands is accessible by a paved road (the New Gold Butte road) and several unsurfaced roads. The

river is muddy most of the year and supports a very limited number of game fish. Success ratios are poor.

Since this is a poor fishing area, little user conflict occurs, although such conflicts could occur if a fisherman were to trespass onto private lands.

Muddy River: All fishing is done either on private, state, or lands administered by other agencies.

7. a. Collecting - Rocks and Minerals

Clark County contains an impressive variety of rocks and minerals. Several gem clubs conduct organized group field trips as well as day excursions by one or a few members. Collecting is particularly good in desert areas where collectibles are often exposed.

The principal collecting areas in the planning units, according to the Boulder City and Las Vegas Gem Clubs, are Goodsprings, Nelson (and Eldorado Mountains), Searchlight (and Newberry Mountains), West End Wash, and the Muddy Mountains. Some of the other numerous collecting spots in Clark County are also discussed.

Stateline Planning Unit

Goodsprings (QCrM-001): This extensive region contains several mines, such as the Potosi Mine, which offers galena, cerussite, and anglesite. The Bird Springs Range is fossiliferous. Collectors from all over the world seek feldspar crystals in Crystal Pass. Some of the other collectibles in the Goodsprings area include galena, wulfenite, zinc minerals, and calamine.

Sunrise Mountain, Frenchman Mountain, Lava Butte (The Thumb) (QCrM-002): Sunrise possesses trilobite fossils, which are rare and highly desirable. Frenchman Mountain and Lava Butte have jasper, agate, swirl agate, and geodes.

River Mountains (includes Three Kids Mine) (QCrM-003): This is mostly private. The primary specimens are amethyst nodules.

McCullough Mountains, North (QCrM-004): This area contains amethystine, quartz, chalcedony roses, agate, pectolites, crystal, and jasper.

McCullough Mountains, North (QCrM-004): This area contains amethystine, quartz, chalcedony roses, agate, pectolites, crystal, and jasper.

Crescent Peak (New York Mountains) (QCrM-005): Crescent Peak sports unakite, epodate, obsidian, geodes, chalcedony, and turquoise.

Dead Mountains (QCrM-009): These mountains contain quartz, feldspar, granite, and garnet.

Virgin Valley Planning Unit

Arrow Canyon (QCrM-101): Fossils and coral are found here.

Access limitations create the main use problem for rock or gem collectors. Examples in Clark County are the Johns-Manville Road (tramroad right-of-way) being closed to the public, private lands, rugged roads being the only access to the North Muddies, and miners placing "No Trespassing" signs across their mining claim roads.

*** Opportunities for enhancement include not granting future tramroad rights-of-way near collecting areas, and seeking out and requiring removal of unauthorized "No Trespassing" signs. Shooters in the Sunrise Mountain area discourage collectors. The problem could be mitigated by designating and patrolling "No Shooting" areas.

North Muddy Mountains (QCrM-102) and Overton Ridge (QCrM-103): These mountains offer petrified wood, quartz, and magnesite.

Muddy Mountains (QCrM-104): Amethyst highlights this area. Jasper, opal, and agate are also collected.

West End Wash (QCrM-105): Anniversary Mine and the Ore Car Mine are significant here. The Ore Car Mine is comprised of three claims held by the Las Vegas Gem Club. Christmas agate highlights the mines collectibles. West End Wash is also known for its swirl agate. Other collectibles include jasper, lilac agate, petrified algae, and travertine.

Virgin Mountains (QCrM-106): Particularly interesting are the Key West Mine and the Silver Leaf Mine (Cabin Canyon). Collectibles include beryl, nickel, schist, hornblende dikes, quartz lenses, and pyrites.

Gold Butte (QCrM-107): Gold Butte is known for a multitude of specimens including concretions, petrified wood, selenite roses, mica, quartz, fossils, limestone, corals, bryophytes, and brachiopods.

b. Collecting-Vegetation

The only vegetation collectible that warrants consideration at this time is pinyon nuts. Rating areas for nut collecting is difficult because the harvestable crop fluctuates considerably from year to year. Key environmental factors such as late frosts and precipitation determine the quantity and quality of pinyon nuts.

An area is suitable for rating if it has been identified as a collecting area in a publication of collecting groups, or by such entities as BLM employees or professional groups. On that basis, the only rated pinyon forest in Clark County is in the Spring Mountains near the Forest Service boundary.

*** Providing access into relatively inaccessible pinyon forest areas such as the South McCullough Range could create new collecting opportunities.

Stateline Planning Unit

Spring Mountains (QCvg-001, 002, 003, 004): There are four popular pinyon nut collecting areas in this mountain range. They are Wheeler Wash/Clark Canyon, Cold Creek/Willow Creek, Lee Canyon/Kyle Canyon, and Trout Canyon/Lovell Canyon. Slopes are moderately steep to steep. The vast majority of the use is by individuals. In 1979, commercial harvesters purchased collecting permits for the Spring Mountains, but after a field check of the area, asked that their permits be changed to Lincoln County.

8. Water Sports

Opportunities for water sports on public lands within the planning units are extremely limited due to the lack of water bodies large enough to provide for such activities. However, Lake Mead National Recreation Area, which borders the eastern edge of the Stateline Planning Unit and the southern edge of the Virgin Valley Planning Unit offers extensive water sports opportunities. This area is described in Recreation Sites-National Park Service.

9. Hang Gliding

Hang gliding in southern Nevada is relatively limited. Most of the use is associated with the Southern Nevada Hang Gliding Association (SNHGA), a small local club. The club sponsors an annual regional meet, though attendance by other than club members has been sporadic.

SNHGA president Brian Way has stated that there are basically four hang gliding sites within Clark County: Sloan, Jean, Mt. Potosi, and Goodsprings (Little Potosi), all of which are located within the Stateline Planning Unit (personal communication 1980). The availability of suitable sites could be a limiting factor if use increased significantly.

In addition to the rating criteria applied in the RIS, Way recommends the factor "Percent of Soarable Days." Soarable refers to wind conditions which allow innovative and lengthy flights. This contrasts with "flyable" conditions, which support only "sled rides." A sled ride is a relatively straight and short descent from launch to landing site (personal communication 1980).

Powered hang gliders have just recently become popular locally. At this time not much information is available. Use appears to be concentrated on the dry lakes. A national meet is proposed for April 1981.

Stateline Planning Unit

Mt Potosi (QHg-001): Mt. Potosi rated considerably lower in the RIS and as only a fair to poor site by enthusiasts, but has potential to become an "excellent site" (Way, SNHGA, personal communication, 1980). The site has a several thousand foot drop, steep slopes, and a large valley to land in. However, use is minimal due to many obstructions (joshua trees), poor access roads passable only by four-wheel drive vehicles, and a lengthy turn around time.

*** Construction of a launch area, upgrading roads, and clearing a landing area could make Mt. Potosi a "World Class Site" (Way, SNHGA, personal communication, 1980).

Goodsprings (Little Potosi) (QHg-002): Goodsprings is a fair site where use is also limited by vegetative obstructions and a long distance between the launch and landing areas.

*** Potential improvements to the site are clearing a landing site closer to the takeoff hill as well as clearing the launch area. This could improve the site significantly.

Sloan Butte (QHg-004): Sloan is rated as a good winter site.

It complements the principal summer site at Jean. Together these offer the majority of hang gliding opportunities in southern Nevada, and as such are very valuable to local enthusiasts. Some of the strong points of Sloan are a steep hill, several flyable slopes, prevailing winds blowing directly into the hill, and a short turn-around time from the base of the hill to the top. Two potentially serious conflicts exist with Sloan. 1) Access to the hill is on a Union-Pacific right-of-way which at times is blocked by a locked gate. 2) The launch area is approximately only 300 feet below the Las Vegas Terminal Control Area (TCA), a level above which McCarran Airport concentrates air traffic. One of McCarran's major approach and takeoff paths is directly over Sloan Butte. Near misses between aircraft and hang gliders have been reported there. SNHGA has in the past voluntarily applied for permits for the hill to try and
*** resolve conflicts and insure continued use of the site. An opportunity to insure access to the launch area exists.

Jean (QHg-005): In the RIS, Jean rates about the same as Sloan. However, based on such factors as percent of soarable days, local fliers rate Jean as the best site in southern Nevada. It is considered an intermediate summer site. Jean offers a steep hill, consistent wind conditions, a large open set-up and landing area, and close vehicular access. Often fliers are able to take off and land at the set up area. There are no apparent major use conflicts with the site.

SNHGA sees improving the access road and providing toilets as the most needed improvements in Clark County (Way, SNHGA, personal communication, 1980).

Other Areas: Black Mountain near Henderson may have potential for days where there are only thermals and minimal winds. Access could pose a problem, as it would be on a locked right-of-way road. The only other known site in Clark County is Table Mountain (QHg-003), near Goodsprings. This site was not rated in the RIS because it was not identified at the time. Table Mountain appears to have good potential for hang gliding.

10. Rock Climbing

Rock climbing is not part of the RIS system, nor has it been considered in previous Nevada BLM planning efforts. Current media coverage and meetings have suggested that local climbing activity and public awareness could increase dramatically during the 1980s.

Stateline Planning Unit

Red Rock Canyon Recreation Lands (QRc-001): Rock climbers generally rate RRCRL as the best climbing area in Nevada. Some of the United States' prime sandstone is found there. Hundreds of routes have been traversed in First Creek Canyon, Velvet Canyon, Sandstone Quarry, Willow Springs, Mount Wilson, Rainbow Wall, Pine Creek Canyon, and Icebox Canyon. Use is by individuals, groups, and technical rock climbing instructors and their students. After a guidebook which is being developed is published, activity could skyrocket and establish RRCRL as the country's premier winter climbing location.

Keyhole Canyon (QRc-002): Keyhole Canyon's small size limits recreational rock climbing. Commercial instructors however use the granite walls. First-timers often have difficulty finding Keyhole Canyon.

Christmas Tree Pass (QRc-003): This is a highly scenic region of large rock outcrops and spires. The majority of the rocks and prime climbing sites are on the eastern slope of the Newberry Mountains, and thus within the Lake Mead National Recreation Area.

Several opportunities exist to improve rock climbing in the above-mentioned areas. Poor access hampers use of some of the climbing areas. Roads into Velvet Canyon and First Creek Canyon are rough and generally passable only by four-wheel-drive vehicles. Access to sites off the RRCRL Scenic Loop Drive could be limited if the proposed night road closure is implemented. Publishing of a guide book on the RRCRL could increase use dramatically and aggravate the already short supply of parking. It could also encourage use by unskilled climbers, thus increasing accidents.

*** An opportunity exists to improve and maintain access to popular climbing areas. Climber registration boxes could be placed at the Visitor Center and near climbing areas. BLM rangers could

undergo Search and Rescue training and develop cooperative relationships with local Search and Rescue organizations. BLM could assist the National Park Service in any developments in the Christmas Tree Pass area and coordinate trail systems and management of the area. Directional signs to Keyhole Canyon could facilitate access.

11. Winter Sports

Winter storms bring low to moderate snowfall to the higher elevations of the planning units. Depth of snow, consistency, and length of season vary considerably from year to year. Generally speaking, the snow season is relatively short. Local residents respond to weather favorable to snowplay by bringing out innertubes, sleds, and other snow toys.

A minimal amount of ski touring is possible and does occur in the Cold Creek area when snow conditions permit. However, due to the short, unpredictable season, neither this area nor any other in Clark County was rated in the Recreation Inventory System.

The Toiyabe National Forest contains a downhill ski resort and developed snowplay sites in Lee Canyon.

*** An opportunity may exist to coordinate ski touring staging areas on BLM land just below the National Forest boundary. An example would be the Cold Creek/Camp Bonanza area.

12. Bicycling

The 1977 Nevada SCORP identified a need for additional bike trails to serve Clark County residents. Clark County Parks and Recreation Department is extending the West Charleston Boulevard bicycle path towards Blue Diamond.

Currently, use conflicts occur when bicyclists ride on the Scenic Loop. The numerous blind corners and high speed drivers on the road make bicycling hazardous.

*** Constructing a bike lane on the RRCRL Scenic Loop Drive, as per the Red Rock Master Plan, would not only facilitate bicycling on the Scenic Loop, but would tie into the proposed county bike lane from Las Vegas.

E. Visitor Use

1. Bureau of Land Management

Off-Road Vehicle Use

According to a survey commissioned by the Heritage Conservation and Recreation Service, some 43.6 million Americans engaged in some form of ORV activity in 1977, including snowmobiling. Motorized recreationists represent 25 percent of the population (Sheridan 1979).

Individual ORV use on the public lands in Clark County is difficult to ascertain since no regular monitoring program currently exists and no surveys have been conducted for this area. It can be estimated that approximately 15,334 motorcycles are used off-highway in Clark County. This figure is derived from the Motorcycle Industry Council's figure of 3.4 off-highway motorcycles per 100 population for Nevada, and the fact that approximately 451,000 people reside in Clark County (Las Vegas Chamber of Commerce 1980). Assuming that an off-highway user would use his vehicle off-highway once every two weeks, it can be estimated that approximately 7,667 motorcycles are being used off-highway each week.

According to the Nevada State Department of Motor Vehicles, there were 69,784 pickup trucks and 261,691 passenger cars registered in Clark County in 1979. Of the number of pickup trucks, it is assumed that roughly 20 percent are 4-wheel drive vehicles and of the number of passenger cars, it is assumed 6 percent are 4-wheel drive vehicles (jeeps, blazers, Broncos, etc). This equates to approximately 29,658 4-wheel drive vehicles being used in Clark County. Assuming the same number of user days for a 4-wheel drive off-roader as for a motorcycle off-roader, it is estimated that some 14,829 4-wheel drive vehicles are being used off-highway every week.

Another figure to note is that there are approximately 10.3 million ORVs in the United States and that roughly 60 percent of their use is concentrated in southern California, southern Nevada, southwestern Arizona, and central Utah (HCRS, FES 78-5, 1978).

Use figures for off-road vehicles are measured in visitor days. A visitor day is 12 visitor hours which may be aggregated continuously, intermittently, or simultaneously by one or more persons. Competitive ORV use figures are derived from the BLM's permit system. Individual ORV use estimates are derived from patrol log figures.

ORV use is increasing in Clark County along with the population growth. The majority of cross-country ORV use is by motorcycles-- both dual-purpose and dirt-bike. There is also a significant amount of cross-country ORV travel by 4-wheel drive vehicles, though the extent of this use is considerably less than that of motorcycles.

In the sections that follow, one must be aware that competitive events involve a certain number of the participants pre-running the course. However, due to the speculative nature of trying to determine a figure for pre-running, it was decided to omit these visitor day estimates.

It should also be noted that use patterns change from year to year. In competitive racing, groups will race one area quite extensively one year, then not too much for a few years. This allows variety and gives nature an opportunity to smooth out the bumps and ruts created.

*** A need exists to monitor ORV use so that an accurate determination of use and impacts can be made.

Stateline Planning Unit

Eldorado Valley: Individual ORV use is heavy due to this area's proximity to the urban centers and its excellent ORV terrain. Use is primarily motorcycles and is concentrated on the weekends.

Use is primarily of the cross-country variety, although considerable trail riding takes place. Eldorado Dry Lake is one of the most intensive ORV use areas in the county. Activities include all types of ORVs, including dunebuggies, trucks, landsailers, and motorcycles.

The vast majority of the competitive use is motorcycles. In 1979, there were 8 permitted motorcycle races involving 633 participants and approximately 1,450 spectators. Since there were only 17 permitted motorcycle competitive events in 1979 in Clark County, this area received nearly 50 percent of those races.

Piute Valley: The area receives considerably less individual use than those areas closer to Las Vegas. Hunters depend on ORVs for access here. As the Las Vegas area grows and the need for more uncrowded play areas arise, this valley will probably see a slow and continual rise in ORV use.

The valley is ideal for cross-country racing, but its location is farther from the urban center. Most of the competitive ORV events occurring here are motorcycle. There were 3 motorcycle races in 1979 involving 298 participants and approximately 700 spectators.

Jean-Ivanpah Valley: Jean and Roach Dry Lakes are important ORV use areas, and are used by all types of ORVs.

The area possesses ideal ORV terrain, but due to its distance from Las Vegas, individual use is limited and estimated to be moderate.

In 1979, 4 motorcycle and 3 dunebuggy races took place here. These races involved 644 participants and approximately 4,050 spectators. This area is heavily used by the ORV competitive groups. Use here continues to rise.

East Vegas Valley, Las Vegas Valley: This area receives extensive and heavy ORV use by individuals. Although ORV use is restricted to existing roads, individuals continue to use vacant lots and areas to ride on. East Vegas Valley receives very heavy use because of the land being public and unoccupied and its short distance from the population centers.

Other than start or finish areas for a few races where dust mitigating measures are applied, no permitted competitive use takes place here as it is part of the Las Vegas Valley Nonattainment Area for air quality.

Spring Mountains: Individual use in this area is heavy with the majority of use being the type required to go camping, hunting, etc. Unrestricted, cross-country travel is low but some does occur.

No permitted ORV competitive events take place in this area, as the 1975 Stateline MFP identified this area as closed to competitive use.

Crescent Peak/Castle Mountains: Both of these areas offer ideal terrain for trailbike riding. The areas are used both by individuals and by ORV clubs. ORV use is moderate here.

During 1979, one motorcycle race was held in the Crescent Peak area, and one motorcycle race was held in the Castle Mountains. These races involved a total of 250 participants and approximately 500 spectators.

McCullough Mountains--North and South, Sandy Valley: In the McCullough Mountains the terrain limits unrestricted ORV use. Most ORV use in these mountains is of the variety involving everything but cross-country travel (i.e. hunting, camping, rock-collecting, etc.). Use is slight.

The Sandy Valley area has ideal terrain for cross-country ORV use, but the area is used only slightly because of its silty soil and distance from the urban centers.

One competitive event, the "Beatty to Vegas" race, occurs in the Sandy Valley each year. This is a motorcycle race involving over 100 participants and approximately 300 spectators runs through the valley. The "Beatty to Vegas" race has the potential to become the largest motorcycle race in southern Nevada. Its sponsors foresee it replacing the old "Barstow to Vegas" race.

Virgin Valley Planning Unit

Dry Lake Valley, Las Vegas Dunes: Both of these areas contain terrain ideal for unrestricted cross-country ORV use. The Las Vegas Dunes is heavily used by individuals, and 4-wheel drive clubs use the area extensively for weekly get-togethers. The Dry Lake Valley sees moderate use.

During 1979, two motorcycle and one dunebuggy race (the Mint 400) took place in the Dry Lake Valley. The two motorcycle races involved a total of 251 participants and approximately 400 spectators. The Mint 400 involved 416 participants and approximately 42,000 spectators.

The Las Vegas Dunes had four dunebuggy races involving 106 participants and over 7,000 spectators.

Mormon Foothills, Mormon Mesa, Gold Butte, Muddy Mountains, Virgin Mountains, Overton Corridor: The terrain of the Mormon foothills, Mormon Mesa, and Gold Butte is ideal for cross-country travel, but individual ORV use here is slight. The Muddy Mountains and Virgin Mountains possess terrain which restricts use to roads, trails, and washes. Use in these areas is slight to moderate. The Overton Corridor is a populated area with much of the land being private. This restricts ORV use to existing roads.

Presently, no competitive events occur in these areas because the 1975 MFP prohibits them here.

Arrow Canyon Range, Meadow Valley, Foothills of the Muddy Mountains: The Arrow Canyon Range sees slight ORV use

because the terrain is limiting and there are very few roads or trails in the area. Meadow Valley and the Muddy Mountain foothills have excellent ORV terrain and use is considered to be slight to moderate. The 4-wheel-drive groups use these areas extensively for weekly get-togethers.

One major motorcycle event (the "Moapa to Vegas" race) occurs in the Meadow Valley area each year involving over 200 participants and approximately 600 spectators. An additional race or two is usually held in the Meadow Valley or Muddy Mountain foothills. Several ORV events have portions of their courses run along the foothills of the Muddy Mountains. The Arrow Canyon Range is closed to competitive events.

TABLE .47-5
Clark County
COMPETITIVE ORV EVENTS UNDER PERMIT IN 1979

<u>Motorcycles</u>			
<u>*Area</u>	<u>No. of Events</u>	<u>Total No. Participants</u>	<u>Total No. Spectators</u>
Dry Lake Valley	2	251	400
Eldorado Valley	8	633	1,450
Piute Valley	3	298	700
Ivanpah Valley	4	463	1,250
Las Vegas Dunes	<u>0</u>	<u>-</u>	<u>-</u>
Total	17	1,645	3,800

<u>4-Wheeled Vehicles</u>			
<u>*Area</u>	<u>No. of Events</u>	<u>Total No. Participants</u>	<u>Total No. Spectators</u>
Dry Lake Valley	1	416	42,000
Eldorado Valley	0	-	-
Piute Valley	0	-	-
Ivanpah Valley	3	181	2,800
Las Vegas Dunes	<u>4</u>	<u>106</u>	<u>7,500</u>
Total	8	703	52,300

*Note: These areas are the primary area of the event; the course of the event usually involves use of many areas (e.g., the "Moapa to Vegas" race uses parts of Meadow Valley Wash, Muddy Mountains, Dry Lake Valley, and the Las Vegas Dunes).

Non-ORV Activities

Numerous types of non-ORV recreational activities have been managed under the Special Recreation Use Permit (SRUP) program in the past. Examples are landsailing, hang gliders, gliders, commercial airplane rides, model airplane shows, commercial hunting, horse rides, bird dog trials, air shows, speed record attempts, and others.

During 1979, six permits were issued for non-ORV recreation events in Clark County. In the years preceeding FY1980, the majority of the non-ORV recreation events were covered under Temporary Use Permits (TUPs), a different program than the Special Recreation Use Permit (SRUP) program. Hence, while the number of SRUPs issued in 1979 for non-ORV events was only six, the actual non-ORV events that took place throughout Clark County were more numerous and varied. Several national model airplane events and an international landsailing regatta are held annually in Clark County. Public lands in the county, particularly Red Rock Canyon and the dry lakes, are becoming popular filming areas for major motion pictures and commercials.

*** These non-ORV recreation events are expected to increase in the future, not only in the number of participants per event, but in the number of different events. Considering this, a stronger resource management and monitoring program could be developed.

Utility and transmission line rights-of-way and surface-disturbing actions such as seismic lines hamper recreational use of the dry lakes, which are some of the most intense and critical recreation use areas in the county. An opportunity exists to retain the surface integrity of the lake beds and, by limiting above-ground towers adjacent to or on the lake beds, to also preserve the air space in these areas.

Stateline Planning Unit

Spring Mountains: There were two permits issued for this area in 1979. One was for commercial hunting involving 16 participants and no spectators; the other for a horse race involving 63 participants and approximately 15 spectators.

Red Rock Canyon Recreation Lands: There was one permit for filming issued in 1979 involving 50 participants and approximately 50 spectators. In past years, this area has usually been used for close to five filming operations.

Ivanpah Valley (Roach Lake): There were two permits issued for this area in 1979. One was for a commercial airplane

event (sightseeing flight) involving 75 participants and no spectators, and one for a landsailing event involving 31 participants and approximately 50 spectators.

Eldorado Valley: One permit (issued for both Eldorado and Ivanpah Valleys) for a commercial airline event (sightseeing flight) on Eldorado Dry Lake was issued in 1979.

Virgin Valley Planning Unit

Dry Lake Valley: One permit was issued in 1979 for a model airplane event involving 25 participants and no spectators.

Red Rock Canyon Recreation Lands (RRCRL)

The RRCRL is used year-round by individuals, families, and groups. The great majority of visitors frequent the desert floor and canyons. State of Nevada surveys indicate that 70 to 85 percent of the recreationists are from Clark County.

Visitation is affected by several factors. Use is considerably higher on weekends. Cool spring and fall months attract greater numbers of visitors, whereas hot summer and cold winter months cause a moderate reduction.

The RRCRL are primarily a day-use area. Oak Creek is the only authorized camping location. A 1975 State of Nevada survey determined that 83 percent of the people came for a short visit of four hours or less. Most (65 percent) planned to sightsee or picnic. Hiking was the next most popular activity.

Use data for the RRCRL is limited though it is available for the main roads and recreation sites. In 1979, recreation visitation on roads was: Scenic Loop Drive 315,000; Blue Diamond Road 776,000; Pahrump Highway 570,000. Table .47-6 depicts use at the major recreation sites.

In addition to the use previously described, several special events and group activities are conducted in the RRCRL.

TABLE .47-6
Stateline Planning Unit

1979 VISITATION AT SPECIFIC SITES IN THE RRCRL

Recreation Site	Number of Visitors ^a
Brownstone Canyon	4,000
Red Springs	67,000
Calico Vista	91,000
Sandstone Quarry	75,000
Whiterock Spring	23,000
Willow Spring	127,000
LaMadre Canyon	1,000
Lost Creek Canyon	6,000
Ice Box Canyon	21,000
Pine Creek Canyon	70,000
Dedication Site	48,000
Cave	142,000
Oak Creek Canyon	10,000
First Creek Canyon	2,000 ^b
Spring Mountain Ranch State Park	90,000

^a Based on 3.5 persons per vehicle (NDSP Visitor Use Survey, 1976)

^b Closed following range fire on July 3, 1979

Source: USDI 1980

--Red Rocks Foot Race: In January of 1980 this first annual race attracted 50 runners and their support crews.

--Horse Races: One or two marathon horse races are held annually.

--Commercial Filming: A combination of approximately five television advertisements and shows, feature length movies, and local media programs are usually shot yearly, though 1979 figures were lower.

--Tour Busses: An increasing number of tour companies make the RRCRL one of their stops.

--Interpretation: Currently presented only on a request basis, this will increase considerably after the completion of the Visitor Center.

--Camping: Groups of 25-50 regularly utilize Oak Creek Canyon, without developed facilities.

All uses in the RRCRL should increase dramatically as the Master Plan is implemented over the next few years.

Cold Creek/Willow Creek

Some 25,000 recreationists visited the Cold Creek/Willow Creek area during 1978. April through October is the heavy use season though the increasing popularity of the area for snow sports is making it a year-round attraction. Much of the area's use is received from the overflow created by the full use of the nearby National Forest recreation sites.

Activity preferences during the spring-fall period are camping, picnicking, hiking, and sightseeing. Other uses are recreational vehicle use (on roads), nature education, horseback riding, photography, historic sightseeing, fishing, woodcutting, and birdwatching.

Family and group camping is the most common recreational activity. On a 1980 summer weekend, at least four groups of 25-50 each camped in the Cold Creek/Willow Creek area. The nearby Wheeler Pass supports dispersed and primitive overnight use.

During winter months, snow play and ski touring are popular, particularly near the Cold Creek Guard Station. Local ski shops instruct ski touring classes there.

Hunting

In 1979, the quail season for Clark County was from October 4, 1979 to January 1, 1980. There were a total of 5,232 hunters who shot a total of 94,738 quail. There were a total of 25,811 hunter user-days. It is estimated that 95 percent of the quail harvest occurs on public land.

There were 3,890 rabbit hunters and the total hunter days was 23,191. These hunters harvested a total of 62,023 rabbits.

Pheasants were introduced into the agricultural areas of Clark County as part of the exotic game bird release program. All of the releases and most of the use have been confined to the State Wildlife Management Area at Overton and private property holdings in the Virgin and Moapa Valleys. Very little, if any, pheasant use occurs on lands administered by the BLM.

Hunting statistics and hunter user days for desert bighorn sheep follows, and are listed in Table .47-7.

Stateline Planning Unit

Spring Mountains: There were 3 reported hunters in this area accumulating 44 hunter user-days. One of the three hunters was successful.

McCullough Mountains/Highland Range: There were 4 reported hunters accumulating 44 hunter user-days. Two of the four hunters were successful.

North Eldorado Mountains: There were 5 reported hunters accumulating 23 hunter user-days. All five hunters were successful.

South Eldorado/Newberry Mountains: There were 3 reported hunters accumulating a total of 11 hunter user-days. All three hunters were successful.

Virgin Valley Planning Unit

Arrow Canyon Range/Meadow Valley Range: There were 6 reported hunters accumulating 30 hunter user-days. Five of the six hunters were successful.

Muddy Mountains: There were 3 reported hunters accumulating 8 hunter user-days. All three hunters were successful.

TABLE .47-7
Clark County
DESERT BIGHORN SHEEP
HUNTING STATISTICS

Area	Reported Hunters	Hunter User-Days	Hunter Success (Hunters)
<u>Stateline Planning Unit</u>			
Spring Mountains	3	44	1
McCullough Mtns/ Highland Range	4	44	2
North Eldorado Mtns.	5	23	5
South Eldorado/ Newberry Mountains	3	11	3
<u>Virgin Valley Planning Unit</u>			
Arrow Canyon/ Meadow Valley Ranges	6	30	5
Muddy Mountains	3	8	3

Source: NDW February 1980.

2. U.S. Forest Service--Toiyabe National Forest

Recreation use on the Las Vegas District of the Toiyabe National Forest totalled approximately 679,500 visitor days in 1979. A visitor day is defined as one person spending 12 hours in the National Forest. The average visit in the area is about 3 or 4 hours, hence a larger number of people visit the area than is reflected in a visitor day.

Eighty per cent of the Toiyabe visitors are from Las Vegas. Use has exceeded 300 percent of the capacity of existing facilities on peak weekends.

About 35 percent of these visitors are sightseeing and driving for pleasure. Picnickers and group campers each represent about 15 percent of the use. Camping is 10 percent as is winter snow play and skiing.

3. National Park Service--Lake Mead NRA

Lake Mead NRA receives heavy recreation use. Visitation in 1979 totalled 6,378,341. In addition to providing a playground for southern Nevada, the NRA (particularly Hoover Dam and Lake Mead) attracts visitors and tours both nationally and internationally.

Major visitor use categories and statistics in 1976 are listed in Table .47-8. Nationally prominent boat and ski races, rockhounding, and hunting are also popular activities.

TABLE .47-8

VISITOR USE AT LMNRA IN 1976

Fishermen	971,311
Swimmers	744,237
Campers	949,511
Water Skiers	362,701
Boats Launched	349,159
Overnight Use at Concessions	415,325

4. Nevada Division of State Parks (NDSP)

The three Clark County units of the NDSP system experience high visitor use. 1979 figures are as follows:

Stateline Planning Unit

Spring Mountain Ranch State Park: Total visitation was 89,835. Of these, approximately 58,400 used the picnic

facilities, 9,010 attended the "Super Summer" cultural programs, and 4,209 were presented guided tours.

Floyd R. Lamb State Park: Total visitation was 174,568. Use dropped ten percent because the lakes are drying up, the zoo was closed, and horseback riding was discontinued.

Virgin Valley Planning Unit

Valley of Fire State Park: Total visitation was 183,132. There were 16,020 visitor use days for camping and 70,393 people who passed through the visitor center.

F. Consumptive Water Use

At present there are no BLM recreation sites in Clark County where water is provided for drinking, washing, or any other consumptive uses. Several areas, though, are identified in this document for planned or potential recreation development with associated water facilities. Table .47-9 depicts rough estimates of the future water needs for the Red Rock Canyon Recreation Lands. (Figures were derived by projecting visitor use and multiplying it by per capita water consumption standards. These standards are listed in the U.S. Forest Service Handbook on "Sanitary Engineering and Public Health.")

TABLE .47-9
Stateline Planning Unit

ESTIMATED WATER CONSUMPTION AT RED ROCK CANYON RECREATION LANDS

<u>Site</u>	<u>Annual Water Use (gallons)</u>
--Visitor Center (Visitors and staff)	230,000
--Campgrounds	96,000
a. La Madre Spring	50,000
b. Oak Creek	42,500
c. Rocky Gap Road (primitive sites)	3,500
--Picnic grounds	46,600
a. Willow Springs	12,800
b. Red Springs	22,500
c. Pine Creek (if developed)	11,300
	TOTAL
	372,600

Assumptions:

1) La Madre Spring and Oak Creek campgrounds and all picnic grounds will have drinking water provided but no flush toilets.

2) The Rocky Gap Road campground will be a collection of 5-10 primitive sites. Forty percent of the campers will gather water from the creek below.

3) Due to turnover during the day, picnic ground sites will be used 1 1/2 times daily.

4) The Sandstone Quarry picnic ground will be a dry site.

Several other recreation sites, particularly Cold Creek/Willow Creek, may be developed with water facilities. It is not possible at this time, however, to estimate the water needs of these developments. These areas include Lovell Canyon, Spring Mountain trail system, Jean Valley regional recreation park, and the Las Vegas Dunes ORV Play Area.

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.47B WILDERNESS

Overlays

One overlay has been prepared for each planning unit, showing designated Wilderness Study Areas.

Tabulations

Table .47-10 Accelerated Wilderness Inventories.....

Table .47-11 Wilderness Inventory Statistics for Clark
County.....

Narrative

1. Introduction

The Federal Land Policy and Management Act (FLPMA) of October, 1976, authorized the BLM to conduct a review and evaluation of all roadless lands with wilderness characteristics. Those lands determined to possess wilderness characteristics have been designated as Wilderness Study Areas (WSAs), and a recommendation concerning their suitability or unsuitability for inclusion into the National Wilderness Preservation System as classified Wilderness Areas is to be reported to the President no later than October of 1991. The President will forward his recommendations for each area to Congress within two years of the date that he receives each recommendation. Congress, then, will make final decisions as to whether or not each WSA will be added to the National Wilderness Preservation System. Any lands classified as Wilderness Areas by Congress will be managed under the provisions of the Wilderness Act of September, 1964 (78 Stat. 891).

To accomplish the wilderness review, the BLM established a program that is composed of three phases: (1) inventory, (2) study, (3) reporting. Inventory consists of reviewing all BLM administered lands and determining which lands do possess wilderness characteristics as defined by the Wilderness Act, and which lands do not. Wilderness Study Areas (WSAs) are designated at the end of this phase. Study is the phase in which the wilderness resource and the other resources in each WSA are evaluated by means of the BLM land use planning process. A determination is made as to whether or not wilderness preservation is the best long-term use of the lands under review. A suitability report is developed, documenting the results of the study process and the rationale for the wilderness recommendation. Reporting is the process of transferring the suitability recommendation for each WSA to the President.

2. Inventory

The inventory process in Clark County consisted of the statewide initial and intensive inventories, and six accelerated inventories. Inventory procedures are documented in the Wilderness Inventory Handbook issued on September 27, 1978.

Initial Inventory: The intent of the initial inventory was to rapidly eliminate lands from wilderness consideration that nearly everyone could agree clearly lacked wilderness characteristics.

The Nevada statewide initial inventory identified those lands that clearly lacked wilderness characteristics and eliminated them from further wilderness consideration. (Some of the inventory units included in the six accelerated intensive inventories were completed using special guidance and were not evaluated through the initial inventory process.) The decisions to eliminate lands in this category were based upon existing data, and only limited field review was conducted. If any possibility existed that certain lands may have possessed wilderness values, they were not eliminated in the initial phase, but reserved for a more intensive field review.

Proposed decisions for the initial inventory were announced on May 1, 1979, by the State Director, and a ninety-day public comment period was initiated on these proposals.

On September 30, 1979, the State Director announced final decisions for the initial inventory, and 1,424,566 acres in 67 separate inventory units were eliminated from wilderness consideration in Clark County.

Intensive Inventory: The statewide intensive inventory consisted of a detailed field review of all lands not affected by accelerated inventories and not already eliminated by the initial inventory. The purpose of the intensive inventory was to determine whether wilderness characteristics existed in each area under consideration. Wilderness characteristics are defined by the Wilderness Act and consist of sufficient size, a generally natural appearance, and either an outstanding opportunity for solitude or for a primitive and unconfined type of recreation.

Supplemental values consisting of ecological, geological, or other features of scientific, educational, scenic, or historical value may be present in a WSA but are not required.

A field analysis consisting of ground and aerial reviews was conducted in the summer and fall of 1979, and an assessment of

all wilderness characteristics was made for each intensive inventory unit. Based on the results of the field analysis, a preliminary determination was made for each area as to whether it qualified as a WSA.

On April 1, 1980, the State Director announced the proposed decisions for each inventory unit subjected to the intensive inventory. Of the 5 units evaluated in Clark County, 151,791 acres in 3 units were proposed to be dropped from further wilderness consideration because they lacked wilderness characteristics, and 93,750 acres in 2 units were proposed as WSAs. A ninety-day public comment period on these proposals concluded on June 30, 1980, and the State Director's final decisions were announced November 14, 1980. The 2 units, Pine Creek and Mt. Stirling, found to possess wilderness characteristics were designated WSAs.

Accelerated Inventories: Six separate accelerated intensive inventories have been conducted in Clark County. These special inventories were similar to the statewide intensive inventory except that public comment time periods were compressed. The purpose of these accelerated inventories was to shorten the time needed to determine whether lands in certain critical areas contained wilderness characteristics, and to make the determination well in advance of the November 14 decision date for the statewide intensive inventory.

Two of these inventories were conducted to inventory lands that might be affected by transmission lines associated with the proposed Intermountain Power Project (IPP). One inventory was initiated to determine whether wilderness values are present in lands within the Overthrust Belt, an area of high interest for oil and gas leasing. Another inventory was conducted on Mormon Mesa, where an application for permit to drill an oil/gas well was filed. The fifth accelerated inventory was initiated to assess wilderness values within the three Natural Areas in the county. The sixth accelerated inventory was initiated to assess the presence or absence of wilderness characteristics within unit NV-050-0408, which was the proposed site for a new state prison.

Table .47-10 portrays the determinations made by these six accelerated inventories.

Table .47-11 shows the entire wilderness inventory statistics for Clark County.

TABLE .47-10
Clark County

ACCELERATED WILDERNESS INVENTORIES

Inventory Name	Date Decision Announced	Number of Units Lacking Wilderness Character	Number of Acres Lacking Wilderness Character	Number of Units Designated WSA	Number of Acres Designated WSA	Total Units Inventoried	Total Acres Inventoried
Mormon Mesa	June 17, 1979	6	81,207	0	0	6	81,207
IPP #1	June 25, 1979	6	222,357	3	188,330	9	410,687
IPP #2	October 1, 1979	1	48,324	4	50,343	5	100,462
Overthrust Belt	March 18, 1980	14	745,417	11***	212,436	25	966,853
Natural Area*	March 20, 1980	3	16,950	0	0	3	16,950
Prison Site	March 20, 1980	1	48,745	0	0	1	48,745
TOTAL**		30**	1,156,440**	18	451,109	48**	1,618,344**

* Natural Areas were inventoried by themselves, and this category includes only Natural Area acreage. The contiguous acreage of the surrounding units was not considered. One of these three areas is also included in the Overthrust Belt Inventory category

** Total units and acres does not include the Virgin Mountain Natural Area (6,560 acres) because this unit was also evaluated with and is included in the Overthrust Belt figures.

*** Protests to the State Director's designation of the Overthrust Belt WSAs were resolved August 22, 1980.

WILDERNESS INVENTORY STATISTICS FOR CLARK COUNTY

Inventory Name	Number of Units Lacking Wilderness Character	Number of Acres Lacking Wilderness Character	Number of Units Designated WSA	Number of Acres Designated WSA	Total Units Inventoried	Total Acres Inventoried
Initial Inventory	67	1,424,566	NA	NA	67	1,424,566
Accelerated Inventories	30	1,156,440	18	451,109	48	1,618,344
Intensive Inventory*	3	151,791	2	93,750	5	245,541
Total	100	2,732,797	20	544,859	120	3,288,451

* Protests to the State Director's decision have been received and will be resolved by February 17, 1981.

3. Study

Procedures for conducting the study phase for all WSAs are presently being developed by the BLM. A draft of the study procedure was issued on December 19, 1980, and will be finalized after a public review and comment period is concluded.

4. Reporting

Procedures detailing the reporting process have not yet been issued by the BLM. It is expected that reporting procedures will be included in the document described above.

5. Natural Areas

The Federal Land Policy and Management Act established a deadline of June 30, 1980, for reporting to the President whether any of the designated Natural Areas should be added to the National Wilderness Preservation System. The three Natural Areas (sometimes referred to as Instant Study Areas) in Clark County have been inventoried and reported on. The Virgin Mountain Natural Area was evaluated in the Overthrust Belt accelerated inventory and found not to possess wilderness characteristics. The Sunrise Mountain Natural Area was likewise found to lack wilderness values through the statewide initial inventory. A deferred report was submitted for the Pine Creek Natural Area concluding that although the designated Natural Area itself does not possess wilderness character when considered alone, it and the contiguous roadless lands located outside of the designated boundary may possess wilderness values when considered as an entire unit. In fact, the November 14 intensive inventory decision designated the Pine Creek unit, including the Natural Area, as a Wilderness Study Area and a final report on the Natural Area and its contiguous lands will be submitted to the President at a later date.

6. Interim Management

During the wilderness review period and until Congress acts on the President's recommendations, the Secretary of the Interior is required to manage Wilderness Study Areas so as not to impair their suitability for preservation as wilderness, subject to certain exceptions and conditions.

The Interim Management Policy (IMP) provides the guidelines for the management of WSAs. It is temporary and applies only during the time an area is under wilderness review and until Congress acts on Wilderness Study Areas. After Congress acts on the President's recommendation for each WSA, a different policy will apply to the area, depending on whether or not Congress designates the area as wilderness. WSAs designated as Wilderness Areas will be managed under a basic policy for permanent wilderness management. The Draft Wilderness Management Policy describing the BLM's proposals for

managing Wilderness Areas was issued for public review on December 19, 1980. WSAs not approved for designation as Wilderness Areas will be released from the interim management restrictions imposed by FLPMA and will be managed according to other applicable BLM policies.

There are five basic, practical effects of "interim management" of lands under wilderness review. First, the general standard for interim management is that lands under wilderness review must be managed so as not to impair their suitability for preservation as wilderness. This is the "nonimpairment" standard, which applies to all uses and activities except those specifically exempted from this standard by FLPMA (such as grandfathered uses).

Second, those grazing, mining, and mineral leasing uses that existed on October 21, 1976 (the date FLPMA was approved), may continue in the same manner and degree as on that date, even if this would impair wilderness suitability.

Third, lands under wilderness review may not be closed to appropriation under the mining laws in order to preserve their wilderness character.

Fourth, valid existing rights must be recognized.

Fifth, the lands must be managed to prevent unnecessary or undue degradation.

Most activities proposed to take place in a WSA will fall under the guidelines of the "nonimpairment" criteria. Activities are considered nonimpairing if they are temporary, their impacts can be reclaimed by the time the Secretary's recommendation on wilderness suitability is sent to the President, and if, after reclamation, the area's wilderness values have not been degraded so far as to constrain the Secretary's suitability recommendation. These general guidelines and others relating to specific activities are detailed in the Interim Management Policy and Guidelines for Lands Under Wilderness Review.

Regulations specific to mining in WSAs were issued as 43CFR Subpart 3802, "Exploration and Mining, Wilderness Review Program." The major objective of these regulations is to "allow mining claim location, prospecting, and mining operations in lands under wilderness review pursuant to the United States Mining Laws, but only in a manner that will not impair the suitability of an area for inclusion in the wilderness system unless otherwise permitted by law."

7. Wilderness Study Areas

WSA Number: NV-050-0201, 0216, & 0217

WSA Name: Fish and Wildlife #1, #2, & #3

Area Description: These 3 units form the narrow strip of public land between the Desert National Wildlife Range and U.S. Highway 93. The WSA is contiguous along its western border to the 1977 wilderness proposal made to Congress by the U.S. Fish and Wildlife Service. The USFWS has applied to have these lands transferred to their administration, but this transfer has not yet been made. Virgin Valley Planning Unit. (A portion of unit 0201 is within the Caliente Planning Unit, but these 3,440 acres are included in the Clark County analysis.)

Wilderness Characteristics:

Size - The shape of the WSAs is approximately 50 miles long and, at its widest point, 3 miles wide. The combined size of the three WSAs is 47,509 acres.

Naturalness: The WSAs are substantially natural or generally appear to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: These WSAs are a contiguous part of a large roadless area proposed as wilderness by the U.S. Fish & Wildlife Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Desert National Wildlife Range wilderness proposal is removed from wilderness consideration by Congress, these WSAs may also be dropped from further study, since they do not offer outstanding opportunities when considered alone. The following analysis of solitude and primitive recreation opportunities is of the BLM land when considered alone.

Solitude: The vegetation in the WSAs consists of the Great Basin shrub community with scattered Joshua trees. The topography is flat and gently sloping to the north, with low mountains at the southern end. Because of the narrow configuration of the units and their minimal vegetative screening, it would be extremely difficult to avoid the sight and sound of other visitors to the area as well as the traffic on U.S. 93.

Primitive and Unconfined Recreation: Opportunities exist for hiking, horseback riding, and nature study. Because of the narrow area that the recreationist is restricted to and the intrusive sight and sound of traffic on U.S. 93, recreation in this area would not be considered outstanding.

Supplemental Values: Cultural resource values exist in the southern portion of the WSAs, including lithic scatters, shelter caves, hunting camps, and campsites.

Designation: These WSAs were evaluated in the Intermountain Power Project #2 Accelerated Inventory, and were designated by the State Director's decision of October 1, 1979.

WSA Number: NV-050-0215

WSA Name: Arrow Canyon Range

Area Description: The unit is located northeast of Las Vegas about fifty miles. It lies at the northern end of the Arrow Canyon Mountain Range. Virgin Valley Planning Unit.

Wilderness Characteristics:

Size - The WSA contains 32,853 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The vegetation ranges from scattered desert shrubs and grasses to several species of cacti and yucca. The topography ranges from a knife-shaped range on the west side to a broad sweeping bajada and rolling valley floor on the east. The topographic screening was found to be adequate to offer outstanding opportunities for solitude.

Primitive and Unconfined Recreation: Opportunities exist for hiking, camping, hunting, horseback riding, and nature study. These opportunities do offer the user several recreational pursuits, but the quality was found to be less than outstanding.

Supplemental Values: The area is rich in cultural expressions of early man, including lithic scatters, shelter caves, hunting camps, and temporary campsites.

Designation: This WSA was evaluated in the Intermountain Power Project #1 Accelerated Inventory and was designated by the State Director's decision of June 25, 1979.

WSA Number: NV-050-0229

WSA Name: Muddy Mountains

Area Description: The unit is located east of Las Vegas, south of Interstate #15, and north of Lake Mead National Recreation Area. Virgin Valley Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 96,170 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The vegetation ranges from desert shrubs and grasses to scattered barrel cactus and yucca species. The topography also varies, from hidden valleys to rugged peaks and ridges. The topographic and vegetative screening were found to be adequate to avoid the sight and sound of other visitors to the area, and to allow an outstanding opportunity for solitude.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, rock and gem collecting, horseback riding, hunting, rock climbing, and nature studies provide outstanding opportunities due to the naturalness and diversity of the environment.

Supplemental Values: Many archaeological sites have been recorded in the area. Lithic scatters, shelter caves, petroglyphs, hunting blinds, and temporary campsites may be found throughout the WSA.

Designation: This WSA was evaluated in the Intermountain Power Project #1 Accelerated Inventory and was designated by the State Director's decision of June 25, 1979.

WSA Number: NV-050-0231

WSA Name: Lime Canyon

Area Description: The unit is located just east of Overton Arm, in the Gold Butte area. It is contiguous on the west to Lake Mead NRA and to the National Park Service wilderness proposal, Unit 12, Overton (24,040 acres). Virgin Valley Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 30,747 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: Vegetative cover in this unit consists of low desert shrubs. The topography is a tall ridgeline oriented north-south, with one steep canyon bisecting it. The remainder of the unit is a flat, sloping bajada. Screening is not adequate to avoid the sight and sound of other visitors to the unit, except for one side of the ridge from the other.

Primitive and Unconfined Recreation: Opportunities exist for hiking, camping, and nature study, but

these opportunities were not found to be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0233

WSA Name: Million Hills

Area Description: The unit is located east of the Overton Arm in the Gold Butte area. It is contiguous on the east to Arizona Strip District inventory unit AZ-010-107, Grand Wash, (8,141 acres); and on the south it is contiguous to the National Park Service wilderness proposal for Lake Mead NRA, unit #17, Indian Hills (15,370 acres). Virgin Valley Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 11,523 acres of public land.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: Most of the vegetative cover is low desert shrubs, with some pinyon/juniper appearing in Immigrant Canyon. The topography is basically flat and sloping, with two small ridges. This combination

of vegetative and topographic screening does not allow one to avoid other visitors to the unit and surrounding area.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, horseback riding, and nature study are available, however, these opportunities were not found to be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0235

WSA Name: Garrett Butte

Area Description: The unit is located east of Overton Arm, in the Gold Butte area. It is contiguous on the west to the National Park Service wilderness proposal for Lake Mead NRA, Unit 13, Twin Springs (10,610 acres). Virgin Valley Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 7,360 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: The vegetation is low desert shrubs. The unit is dominated by two solitary buttes and a ridgeline along the eastern boundary. The central portion of the unit has flat and sloping topography. Combined with the lack of vegetative screening, it is difficult to avoid the sight and sound of other visitors to the area.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, horseback riding, and nature study are available, however, these opportunities were not found to be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0236

WSA Name: Jumbo Springs

Area Description: The WSA is located east of the Overton Arm, in the Gold Butte area. It is contiguous on the south and east to the National Park Service wilderness proposal for Lake Mead NRA, Unit 16, Hell's Kitchen (8,545 acres). Virgin Valley Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 3,811 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area

wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: The vegetation ranges from desert shrubs in the south to pinyon/juniper in the north. The topography contains many peaks and ridges. Topographic and vegetative screening are inadequate to avoid the sight and sound of other visitors to the area, and to allow an outstanding opportunity for solitude.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, horseback riding, and nature study are available, however, these opportunities were not found to be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0238

WSA Name: Bonelli Peak

Area Description: The unit is located east of the Overton Arm, in the Gold Butte area. It is contiguous to the National Park Service wilderness proposal for Lake Mead NRA, Unit 14, Scanlon Wash (22,095 acres). Virgin Valley Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 6,581 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative

boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: The vegetation is low desert shrubs. The topography consists of one mountain peak, with radiating ridges and canyons. The minimal vegetative screening makes it difficult to avoid the sight and sound of other visitors to the area and to provide an outstanding opportunity for solitude.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, and nature study are available, but these opportunities were not found to be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0401

WSA Name: Mount Stirling

Area Description: The unit is 45 miles northwest of Las Vegas and contains the north end of the Spring Mountains, including Mt. Stirling. Stateline Planning Unit. (A portion of the WSA, 2,000 acres, is within the Esmeralda Planning Unit, but is included in the Clark County analysis.

Wilderness Characteristics:

Size: The WSA totals 69,750 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The WSA contains a large portion of the Spring Mountain Range found north of the National Forest boundary. This area possesses a wide variety of topographic and vegetative screening. The availability of secluded spots is excellent and the opportunity for solitude was considered outstanding.

Primitive and Unconfined Recreation: Opportunities for camping, hiking, horseback riding, nature studies, and hunting and trapping are available. These opportunities were considered to be outstanding.

Supplemental Values: There are significant archaeological and botanical values, including bristlecone pine.

Designation: This WSA was evaluated in the State Intensive Inventory, and was designated by the State Director's decision of November 14, 1980.

WSA Number: NV-050-0411

WSA Name: Quail Springs

Area Description: The unit is located along the southern boundary of the Desert National Wildlife Range, and is contiguous along its northern boundary to the 1977 wilderness proposal made to Congress by the U.S. Fish and Wildlife Service. Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 12,225 acres and has an irregular configuration of about 9 miles in length and 3 miles in width at its widest point. The contiguous unit of the USFWS wilderness proposal contains 40,900 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the U.S. Fish & Wildlife Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be

noted that if the Desert National Wildlife Range wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: The vegetation in the area is low-growing desert shrubs. The topography consists of a gently sloping flat area. Because of the minimal vegetative and topographic screening, traffic on U.S. 95 is visible from all points in the unit and it would not be possible to avoid the sight of other visitors to the area.

Primitive and Unconfined Recreation: Opportunities exist for hiking and horseback riding, but the quality of these opportunities would not be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0412

WSA Name: La Madre Mountains

Area Description: The unit is located just west of Las Vegas, and is contiguous to the Toiyabe National Forest along its northern boundary. Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 56,243 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The vegetation varies from low desert shrubs on the flatlands to pinyon/juniper in the

mountains. The topography includes ridges, mountains, and flat, sloping bajadas. The configuration has been determined to offer an outstanding opportunity for solitude.

Primitive and Unconfined Recreation: Opportunities exist for hiking, camping, backpacking, hunting, and nature study.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0414

WSA Name: Pine Creek

Area Description: The WSA is just west of Las Vegas in the Red Rock Canyon Recreation Lands. The western boundary is the Lovell Canyon road, the northern boundary is the Red Rocks Summit/Willow Springs road, the eastern boundary is the Blue Diamond road, and the southern boundary is State Highway 16. The area offers a wide variety of landscapes and vegetation including the spectacular Red Rocks Escarpment. The WSA also contains the Pine Creek Natural Area. Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA totals 24,000 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The vegetation is low desert shrubs at the lowest elevations, ranging through pinyon-juniper, to ponderosa pine on the escarpment. The topography rises 3,000 feet from the valley floor in spectacular, sheer sandstone cliffs with narrow, deep canyons eroded into them. The top of the escarpment has jagged cliffs and hills, with rolling rounded hills sloping down into Lovell Canyon. The

vegetative and topographic screening together offer outstanding opportunities to obtain solitude.

Primitive and Unconfined Recreation: Opportunities for hiking, botanical nature studies, camping, sightseeing, hunting, photography, technical climbing, geological studies, and horseback riding were identified. The diversity and uniqueness of the environment, the recreational challenge, and the spectacular scenery contribute to the outstanding opportunity for primitive recreation offered by this unit.

Supplemental Values: The area contains many significant archaeological sites and numerous botanical values, including several unique and/or endangered species. The Pine Creek Natural Area is within the WSA. See the case file for more detailed information.

Designation: This WSA was evaluated in the Statewide Intensive Inventory, and was designated by the State Director's decision of November 14, 1980.

WSA Number: NV-050-0423

WSA Name: Eldorado

Area Description: The WSA is located just south of Boulder City, and is contiguous on the east to the National Park Service wilderness proposal for Lake Mead NRA, Unit 5, Eldorado Mountain (29,665 acres). Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 12,596 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area

wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: The vegetation is primarily desert shrubs, with some scrub oaks in Oak Creek Canyon. The topography of the unit is flat to the north and northwest, and rugged mountains to the south. The minimal vegetative screening makes it difficult to avoid the sight and sound of other visitors to the area and of the many intrusions in the unit.

Primitive and Unconfined Recreation: Opportunities are available for hiking, camping, nature study, and especially horseback riding, however, these opportunities were not found to be outstanding.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0425

WSA Name: North McCullough Range

Area Description: The WSA is located just south of Las Vegas. Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 52,258 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The vegetation is low desert shrubs and grasses. The topography consists of a mountain range with several peaks and valleys, sloping away to flat bajadas to the east and west. The vegetative and

topographic screening is adequate to avoid the sight and sound of other visitors and the opportunity for solitude was determined to be outstanding.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, horseback riding, and nature study are available within the WSA.

Supplemental Values: There are several known cultural sites, including lithic scatters, shelter caves, temporary campsites, and rock art.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-0435

WSA Name: McCullough Mountains

Area Description: The WSA is located 40 miles south of Las Vegas. It lies west of U.S. Highway 95 and east of Interstate 15. Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 59,307 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities:

Solitude: The vegetation ranges from desert shrubs found in the low elevations to pinyon/juniper stands at the higher elevations. The topography varies from broad sweeping bajadas around the base of the range to rolling hills, ridges, draws, and canyons found within the center of the unit. The topography and vegetation offer outstanding opportunities for solitude.

Primitive and Unconfined Recreation: Opportunities for hiking, horseback riding, hunting, camping, and nature study are considered to be outstanding due to the natural environment.

Supplemental Values: The area has known archaeological sites and areas, including lithic scatters, shelter caves, and temporary campsites.

Designation: This WSA was evaluated in the Intermountain Power Project #1 Accelerated Inventory, and was designated by the State Director's decision of June 25, 1975.

WSA Number: NV-050-0438

WSA Name: Ireteba Peaks

Area Description: The WSA is located northeast of Searchlight, and is contiguous on its eastern boundary to the National Park Service wilderness proposal for Lake Mead NRA, Unit 4, Opal Mountain (17,635 acres). Stateline Planning Unit.

Wilderness Characteristics:

Size: The WSA contains 13,374 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the National Park Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Lake Mead National Recreation Area wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding opportunities when considered alone. The following analysis is of the BLM land when considered separately from the contiguous agency's land.

Solitude: The vegetation is desert shrubs with scattered joshua trees and some pinyon/juniper as the elevation rises. The topography is a central mountain range with small canyons, sloping down to flat bajadas to the east and west. The vegetative and topographic screening is inadequate to avoid the

intrusions to the west, and does not provide an outstanding opportunity for solitude.

Primitive and Unconfined Recreation: Opportunities for hiking, camping, horseback riding, hunting, and nature studies are available, but these opportunities were not found to be outstanding.

Supplemental Values: There are cultural resource values in the form of shelter caves, quarry sites, and temporary campsites.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory, and was designated by the State Director's decision of August 22, 1980.

WSA Number: NV-050-04R-15

WSA Name: Nellis

Area Description: This WSA is located at the northern end of the Las Vegas Valley and is contiguous on the north to the 1977 wilderness proposal made to Congress by the U.S. Fish and Wildlife Service. Stateline Planning Unit.

Wilderness Characteristics:

Size: The three WSA portions contain 5,718 acres combined. They are irregularly shaped areas, separated by roads. The contiguous unit of the USFWS wilderness proposal contains 40,900 acres.

Naturalness: The WSA is substantially natural or generally appears to have been affected by the forces of nature with the imprint of man's work substantially unnoticeable.

Outstanding Opportunities: This WSA is a contiguous part of a large roadless area proposed as wilderness by the U.S. Fish & Wildlife Service. Opportunities for solitude and primitive recreation do not stop at the administrative boundary which is unmarked on the ground, and therefore the outstanding opportunities already identified by the other agency are shared by the BLM land. It should be noted that if the Desert National Wildlife Range wilderness proposal is removed from wilderness consideration by Congress, this WSA may also be dropped from further study, since it does not offer outstanding

opportunities when considered alone. The following analysis is of the BLM land when considered separately from the other agency land.

Solitude: The predominant vegetation is creosote, with some yucca in the northern portion. Most of the unit is a flat bajada gently sloping south from the Sheep Range and is highly eroded. Because of the lack of vegetative and topographic screening and the numerous access routes in the unit, it would be extremely difficult to avoid other visitors to the unit and experience outstanding solitude.

Primitive and Unconfined Recreation: The quality of the few available recreational opportunities, such as hiking, horseback riding, and nature study, is rated fair to poor in this area.

Supplemental Values: None known.

Designation: This WSA was evaluated in the Overthrust Belt Accelerated Inventory and was designated by the State Director's decision of August 22, 1980.

8. References

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47C CULTURAL RESOURCES

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.47C Cultural Resources

Overlays

Three overlays have been prepared for each planning unit. The Cultural Resource Sites Overlays show sites by their identification number, identify the site type with the symbols listed in Table .47-12, and indicate the cultural significance of each site according to the CRES. The Cultural Resource Inventories Overlays show Class II and Class III surveyed areas, and the Cultural Resources Report number of the original field data. The Archeological Sensitivity Overlays show environmental zones for hydrology (active or extinct waters), pinyon-juniper areas, agave vegetation areas, and their overlap.

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Existing Data

Currently, over 2,500 cultural sites are known in Clark County and most have been plotted on the Cultural Resources Sites Overlay. See Table .47-12 for the symbols used to identify each site type on this overlay. Typical sites recorded include flake scatters, rockshelter sites, rock art sites (petroglyphs and pictographs), and temporary campsites (containing chipped stone and ground stone with ceramics). Other sites known in Clark County include agave roasting pits, village sites, and aboriginal sites with structures (architectural features), such as stone walls, mounds, and hunting blinds.

Many historic sites are also known for Clark County.

Nearly 700 Cultural Resource Reports (CR Reports) containing detailed information have been filed on the Las Vegas District since 1974. These reports are available in District Records. The sites identified on the Cultural Resource Sites Overlays have not been compiled into tables for this narrative because of the amount of space the listing of such data would require.

Culture History

Clark County encompasses a portion of Nevada that must be considered geographically and environmentally transitional.

The transitional character of the area creates a diversity in the natural environment which is concomitantly reflected in the cultural history of the region. Although no definitive outline of human prehistory has been set forth for the area within Clark County, there does exist a sufficient body of data to establish at least a general picture of the culture history of the area.

TABLE .47-12
Clark County

CULTURAL RESOURCES SITE SYMBOLS

- A = Open/aboriginal/chipped stone only.
- B = Open/aboriginal/chipped and ground stone present.
- C = Open/aboriginal/ceramics present, with chipped and/or ground stone.
- D = Open/aboriginal/apparent significant depth.
- E = Rockshelter-cave-overhang/aboriginal/with surface materials.
- F = Rockshelter-cave-overhang/aboriginal/with surface materials and apparent significant depth.
- G = Rock art (petroglyphs and/or pictographs)/aboriginal.
- H = Rock art/aboriginal/with associated chipped and/or ground stone.
- I = Rock art/aboriginal/with rockshelter-cave-overhang.
- J = Rock art/non-aboriginal (attributable to whites or other non-native peoples).
- K = Aboriginal site with roasting pit(s).
- L = Aboriginal site with structures (architectural features), such as: stone walls, mounds, circles, depressions, hearths, hunting blinds, etc. Other than roasting pits.
- M = Historical/non-aboriginal/with structures.
- N = Historical/non-aboriginal/no structures.
- O = Historical/aboriginal.
- P = Paleontological remains present.
- Q = Cultural District/aboriginal. (For National Register an "Archeological District").

TABLE .47-12(continued)
Clark County

CULTURAL RESOURCES SITE SYMBOLS

- R = Cultural District/non-aboriginal (For NR an "Historic District").
- S = Rockshelter-cave-overhang, possible occupation.
- T = Rockshelter-cave-overhang/aboriginal/with chipped and ground stone and ceramics.
- X = Isolated find - "small" site/aboriginal or non-aboriginal/sites that are normally recorded on BLM/NSO form 6230-2 (green sheet).
- Z = Location indefinite.

These symbols are used to identify sites on the Cultural Resource Sites Overlays.

The prehistory of the county has been subdivided into nine phases, each characterized by different diagnostic artifacts and settlement/subsistence patterns. A brief description of each phase follows below, adapted from Hauck et al. (1979) and Weder (1979). See Table .41-13 for a brief summary of the following cultural sequence discussion.

Tule Springs Phase: (about 13,000 to 10,000 years Before Present) This is a poorly known phase, defined by the work conducted at the Tule Springs site, consisting of a series of hearths (floors of fireplaces) dated between 13,000 and 10,000 B.P. No diagnostic artifacts were recovered at this site, only a few flakes and scrapers; however, this phase is probably related to the Paleo-Indian manifestations found along the extinct lakeshores within the county, such as Roach, Jean, and Ivanpah Lakes. It is conjectured that the settlement/subsistence pattern consisted of the hunting of large animals adapted to a lakeshore environment, such as bison, mammoth, and camel.

San Dieguito Phase: (about 9,000 to 7,500 years B.P.) This phase is characterized by the finding of a few Lake Mojave and Silver Lake projectile points during surface surveys in the Tule Springs area. It is hypothesized that the settlement/subsistence pattern was similar to that of the preceding Tule Springs Phase.

Hiatus: (about 7,500 to 5,500 years B.P.) An occupational hiatus is hypothesized for this period since no sites dating to this time period have yet been located either in Clark County or in the southwestern Great Basin. A warming and drying trend that occurred during this period may be responsible for this hiatus; however, excavation of deeply stratified sites may eventually yield evidence of occupation.

Little Lake Pinto--Gypsum Phase: (about 5,500 to 2,000 years B.P.) During this phase the county may have been occupied by two culture groups, one characterized by Little Lake Pinto and Humboldt projectile points and the other identified by Gypsum points. These points have been found on surveys and at sites in Clark County, including Stuart Rockshelter, Corn Creek Dunes, and Gypsum Cave.

This phase saw a change in settlement/subsistence patterns, possibly due to a drier climate. A reasonably nomadic

TABLE 47-13

Clark County

CULTURAL SEQUENCES

Phase	Years Before Present (B.P.)	Diagnostic Artifacts	Settlement/Subsistence, Lifestyle, etc.	Location in County	Significant Notes
Tule Springs	13,000-10,000	Generalized flakes & scrapers	Small, impermanent camps; hunting of megafauna in lakeside environments	Extinct lakeshores & surrounding hill-sides	Phase needs more sites to be found, excavated, & dated
San Dieguito	9,000-7,500	Lake Mojave & Silver Lake projectile points	Same as Tule Springs	Same as Tule Springs	Same as Tule Springs
Hiatus	7,500-5,500	None-conspicuous in their absence	—	—	Excavation of deeply stratified sites will prove or disprove the existence of this phase
Little Lake Pinto-Gypsum	5,500-2,000	Little Lake Pinto - Gypsum - Humboldt projectile points	Rockshelters, open camps by springs prevalent; hunting of small game, wild flora gathering; seasonal movement to exploit wild resources; roasting pits	General throughout the county	Continuation of previous lifestyles in Clark County
Moapa	2,000-1,450	Pithouses, side & cornernotched dart points	Semipermanent villages on high bluffs above river valleys, temporary camps & caves in mountains; some agriculture & wild resource exploitation	Muddy & Virgin River Valleys, eastern half of Clark County	First semipermanent villages, & first Puebloan occupation of Nevada

TABLE .47-13 (continued)
Clark County

CULTURAL SEQUENCES

Phase	Years Before Present (B.P.)	Diagnostic Artifacts	Settlement/Subsistence, Lifestyle, etc.	Location in County	Significant Notes
Muddy River	1,450-1,250	Pithouses, ceramics first appear, bins & cists for food storage, small projectile points, ceramic figurines	Pithouse villages on low knolls or mesa tops above the Virgin & Muddy River Valleys for agricultural purposes; open campsites & rock shelters for wild resource exploitation	Muddy & Virgin River Valleys, eastern half of Clark County	Larger populations more dependence on agriculture, long distance trade
Lost City	1,250-850	Surface pueblos & pithouses, black-on-white ceramics, small projectile points	Surface pueblos or combined pithouse pueblo villages in the river valleys for agricultural purposes; open camps & rock shelters for wild resource exploitation; turquoise & salt mining, trade	Muddy & Virgin River Valleys, eastern half of Clark County	Widespread Puebloan occupation in eastern Clark County, long distance trade south & west
Mesa House	850-800	Very few surface pueblos; many projectile points; ceramics	Circular villages on bluffs overlooking valleys for defense; agricultural activity in the valleys	Muddy & Virgin River Valleys	Possible resource competition/warfare either intervillage or with Paiutes. Pueblo abandonment of Nevada

TABLE .47-13 (continued)
Clark County

CULTURAL SEQUENCES

Phase	Years Before Present (B.P.)	Diagnostic Artifacts	Settlement/Subsistence, Lifestyle, etc.	Location in County	Significant Notes
Protohistoric	950-200	Shoshoni/Paiute-brownware ceramics, desert side-notched points	Temporary shelters & sites, brush huts, rockrings, rock shelters, open camps, roasting pits. Some horticulture, mixed wild resource exploitation	Shoshoni-northwest Clark County; Paiute-southern & eastern Clark County	These are the agricultural groups encountered by the early Spanish & American explorers & settlers
		Mojave/Yuman-agricultural villages, buff & red-on-buff ceramics	Permanent floodplain villages, temporary open sites & rockshelters; agriculture & wild resource exploitation	--	
Historic	200-present	Spanish exploration-American settlement artifacts modern American material culture	Permanent towns & cities, large ranches, mining, some agriculture, ranching gaming activities	Throughout Clark County	--

subsistence pattern using a wide variety of resources is indicated by the presence of sites in many ecozones, and by the presence of grinding equipment for floral resource exploitation at these sites. Site types include rock-shelters, temporary camps by springs, roasting pits, and circular rock alignments.

Moapa Phase: (about 2,000 to 1,450 years B.P.) This phase of occupation in Clark County corresponds to Puebloan Basketmaker II occupations in northern Arizona. The settlement pattern was characterized by pithouse dwellings, corner and side-notched projectile points, and no ceramics. These sites were located on floodplains, indicating that horticulture, as well as hunting and gathering wild resources, formed a component of Basketmaker II subsistence in Nevada.

Muddy River Phase: (about 1,450 to 1,250 years B.P.) This phase corresponds to Basketmaker III artifact assemblages elsewhere, and follows the settlement/subsistence pattern of the previous Moapa phase. New artifactual developments marking this phase include the introduction of ceramics and the use of small-notched projectile points. The mining of local salt deposits also began during this phase.

Lost City Phase: (about 1,250 to 850 years B.P.) Population increased in the Muddy and Virgin River Valleys during this phase, as exhibited by the establishment and growth of multidwelling sites containing both pithouses and adobe surface structures. Their location in the floodplain areas indicates a horticultural subsistence pattern, complemented by the gathering of wild resources exploited at shelter caves, temporary camps, and agave roasting pits.

Salt mining activities in Moapa Valley continued, and expanded to include turquoise and selenite crystal exploration. These resources were traded with California groups as indicated by the presence of coastal shell of several different species at sites of this phase.

This phase has been dated to Pueblo I and II times by ceramic cross-dating with the Kayenta Pueblo area in northern Arizona.

Mesa House Phase: (about 850 to 800 years B.P.) This terminal Puebloan occupation continued the architectural and subsistence patterns of the previous phase. Population decreased and competition for resources increased, as exhibited by the smaller number of sites located. The location of these sites on mesa tops and their orientation

made them more easily defensible. A slight drying trend causing environmental deterioration, and the appearance of the southern Paiute in the area may have contributed to the general depopulation of the region. Competition may have disrupted the shell and selenite trade although salt and turquoise mining continued.

The end of Puebloan occupation of the county marks the termination of this phase.

Protohistoric Phase: (about 950 to 200 years B.P.) Numic-speaking southern Paiute and Shoshone groups entered Clark County from the west about 950 B.P., and eventually replaced the Puebloan groups in the area. Archeologically, the Paiute and the Shoshone are quite difficult to distinguish from one another, since their settlement/subsistence patterns are so similar.

The Southern Paiute followed a seasonally nomadic subsistence lifestyle, like the previous Pinto-Gypsum phase peoples, exploiting wild resources near rockshelters, and locating temporary camps, small brush huts, and roasting pit sites in association with springs, situated in a variety of ecosystems. Some horticulture was practiced. The Paiute manufactured a distinctive style of brownware ceramics that serve as the culture's primary diagnostic feature. Their way of life survived until it was disrupted by Euro-American contact in the 19th century. Currently, the Southern Paiutes occupy the Moapa Indian Reservation in Clark County and the Las Vegas Colony in Las Vegas. Their origin is not known.

The Shoshone closely resembled the Paiute in culture and settlement/subsistence patterns. They occupied the northwestern corner of Clark County and were probably allied with Southern Paiute groups in that area.

Yuman-speaking groups entered the Lower Colorado River region and the southern tip of Nevada about 1,000 B.P., practicing floodplain horticulture and exploiting a variety of wild floral resources. They also traded extensively into southern California and into Arizona, as evidenced by the finding of their buff and red-on-buff ceramics in these two localities. Yuman ceramics have also been found as far north as the Spring Mountains and at Puebloan sites in the Virgin and Muddy River Valleys, but it is unknown if they were contemporaries of the Puebloan groups or reoccupied abandoned Puebloan sites.

The Mojave who occupied southern Clark County are believed to be descendants of the early Yuman occupants of the

region. They pursued floodplain horticulture, wild flora exploration and traded widely, as it is believed their ancestors did. They are now settled on two reservations, one of which is located in southern Clark County at Fort Mojave.

Historical Phase: (about 200 years B.P. to present)
Francisco Garces was the first European in Clark County, leading five expeditions between 1760 and 1780 in attempting to convert the Indians and establish an overland route between New Mexico and southern California. The next exploration occurred in 1826 when Jedediah Smith entered Clark County. He was followed by several other explorers/trappers and expeditions in the 1830s and 1840s along the route known as the Old Spanish Trail. The Old Spanish Trail was in active use between 1829 and 1848 by pack caravans and by John C. Fremont who traveled easterly along the road in 1844. Traces of this important wagon road are still visible in parts of Clark County today (Hauck et al. 1978).

In the 1850s and 1860s the U.S. Government sent expeditions into the Great Basin in order to establish permanent wagon roads and later to determine the best route for the trans-continental railroad. One of these early routes which crossed the Colorado River at Fort Mohave became known as the Mojave Trail or Old Government Road. This road once linked Los Angeles with Prescott, Arizona, and was in use between 1858 and 1882. Traces of this historic road are visible today, as it winds its way across the southern tip of Clark County.

The first settlement in Clark County was a Mormon missionary post and rest station established at Las Vegas in 1855, which was followed by subsequent Mormon expeditions to export lead and other minerals. This settlement and the miners were recalled in 1857.

New agricultural settlements were established in the Muddy and Virgin River Valleys in the 1860s and 1870s. These areas went through subsequent cycles of founding, abandonment, and resettlement.

Octavius Gass bought the Mormon rights in Las Vegas and established a ranch which was ultimately purchased by William Clark in 1903. Clark auctioned off parcels of land to help establish a town for use as a railroad way station. Ranches were established in Las Vegas Valley, and eventually farms and ranches were established in the Spring Mountains and along the Muddy and Virgin Rivers.

Mining flourished in the 1860s and 1890s, but activity was sporadic due to the fluctuating price of silver. Gold, lead, copper, and zinc were also mined. In recent years non-metallic minerals, primarily gypsum, dolomite limestone, and silica sand have been the principal mining products in Clark County (see Section .42, Minerals).

With these settlements came the establishment of military posts to protect whites from Indian attack and to insure Federal control of the mines during the Civil War. The first such post was Camp Colorado, established in 1859 at the Mojave Trail crossing at the Colorado River, and later renamed Fort Mojave.

In the 1930s Hoover Dam was built and the gambling laws were liberalized, radically changing the economic base of Clark County. The influx of people due to dam construction was followed by an increase in tourism, and recreation revenue.

Consequently, the gambling laws were modified further to exploit the recreation trade and as a result gambling and tourism have become the basis of the economy of Clark County.

Inventory and Policy

The Bureau of Land Management, along with other federal agencies, is required by Executive Order 11593 to make an inventory of cultural resources on lands under their control. Regulations also require cultural resource inventories of lands about to be disturbed or exchanged. Three levels of inventory are provided for by BLM.

Class I: This is an existing data inventory, providing review and synthesis of the existing prehistoric and historic data for a defined area. It identifies all recorded sites in the study area and provides a culture history overview for that area.

Class II: This class of inventory provides for an extensive on-surface field sampling inventory within a portion of the defined area. This is a sampling procedure that allows the assessment of the cultural resources of a large area, providing data for management decisions. UNLV has recently completed a Class II inventory within the Virgin Valley Planning Unit.

Class III: This inventory is designed to identify and record all cultural resources within a defined area.

This is an agency effort, required by BLM any time the ground surface is to be altered by any type of surface-disturbing activities.

Areas of Archeological Sensitivity: Generally, anywhere live or extinct waters occur, there will also be an archeological site. In addition, task-oriented sites such as quarries, stone workshops, roasting pits, etc., tend to be located near available resources. Such sensitive sites are depicted on the Archeological Sensitivity Predictive Overlay. Pinyon-juniper zones and agave zones are also delineated on this sensitivity overlay as possessing a high potential for aboriginal site occurrences.

Due to the lack of comprehensive archeological inventory data for the county, any locality could exhibit potential for containing cultural values. However, some information has been developed concerning probability levels or which areas are more or less likely to have archeological resources. A probability overlay or predictive model, has been compiled from data on hydrology and pinyon-juniper and agave vegetation zones. These three environmental variables are associated with high probability areas. Any project that will involve disturbance of previously undisturbed, or minimally disturbed, land surfaces within these high sensitivity zones should be subject to archeological survey at a Class III level of inventory prior to implementing the project.

All known archeological sites, historic or prehistoric, are delineated on the Cultural Resources Site Location Overlay. Each is coded as to its significance according to the Bureau of Land Management's Cultural Resources Evaluation System (CRES) (NSO Instruction Memo NV-80-378). Five levels of significance are recorded. These ratings are usually assigned by District archeologists in the context of a Class II or Class III inventory, and are not necessarily static. CRES ratings should be periodically reviewed and changed as new information becomes available.

- S1- Sites clearly eligible for nomination to or actually listed in the National Register of Historic Places. BLM will work aggressively to insure the physical preservation of S1 properties.
- S2- Sites not immediately eligible for S1 status, but which are of unusual significance. With additional data, these sites could be classified S1.
- S3- Sites containing potential scientific or cultural value, but not eligible for nomination to the National Register

of Register of Historic Places. BLM will institute measures (other than normal protection from vandalism) to actively preserve such sites only when they are threatened by a proposed activity.

S4- Sites that have been destroyed either through vandalism, collection, natural deterioration, or scientific excavation. These sites warrant no further consideration except for analytical purposes.

S0- Temporary site classification where there is insufficient data to assign a rating, or where the site is too contemporary to be rated.

Research

Hauck (et al. 1979: 4-6) have identified three periods of archeological work conducted in Clark County, differentiated by theoretical orientations and goals.

Exploration and Description Period: (1826 to 1920) Work consisted essentially of travelers' reports concerning ruins, artifacts, mines, and other cultural resources in southern Nevada. Several archeologists visited the area, including A.V. Kidder, A.P. Mera, and N.C. Nelson, but never published the results of their limited research.

Reservoir Salvage and Early Man Investigation Period: (1920 to 1979) The first real archeological work was conducted during this period. Most of the early work was conducted under the supervision of Mark R. Harrington, who excavated Lost City and many other sites in the Muddy and Virgin River Valleys that are inundated by Lake Mead. His work at Gypsum Cave created controversy over the supposed association of human artifacts and extinct sloth remains. He also worked at Tule Springs, a problematic Early Man site that yielded a radiocarbon date of 23,000 B.P. and thus created considerable controversy, since it was generally believed by archeologists at that time that man had arrived in North America only about 12,000 years ago.

The Shutlers began working in the 1950s at Stuart Rockshelter in the Meadow Valley Wash. They summarized the Puebloan data originally gathered by Harrington, and their 1961 publication presents basic data on Puebloan occupation in Clark County. The Shutlers also worked at Tule Springs, conducting a large multidisciplinary project that recovered a few artifacts.

Radiocarbon samples from several hearths in Tule Springs yielded dates between 13,000 B.P. and 10,000 B.P., leading Shutler to conclude that Harrington's data came from a mixed contaminated sample. The discrepancy apparently resulted from some of Harrington's dates having come from a layer of carbonized plant material surrounding an extinct spring.

This points up a basic research problem that needs to be dealt with in Clark County. Accurate dates for the Tule Springs phase are necessary to establish a framework for more detailed Early Man studies. This means that additional sites contemporaneous with Tule Springs need to be located so that radiocarbon samples can be taken to solve this problem. A firming up of the chronology is essential for other study to have a base to operate from.

- *** Locating additional sites would allow study of settlement/subsistence patterning that one could have some confidence in, rather than relying on conjecture from one controversial site. Surveys around the dry lakes in Clark County--Hidden Valley, Dry Lake Valley, Jean Lake, Roach Lake, and Indian Springs Valley--would help to test the lacustrine (lake-deposited)-oriented settlement pattern hypothesis and provide detailed data on this phase.

Contract Archeology Period: (1970 to present) This period has resulted in a much larger inventory of Clark County in previously unsurveyed areas, correcting some areal biases from earlier work. Oil and gas investigations, inventories incidental to land alterations, and other projects requiring archeological clearance have recorded a wide variety of type sites, particularly temporary camps and task-specific activity sites. This data has helped to spur settlement/ subsistence pattern studies for all phases of culture history in the county, giving archeologists a much clearer picture of the prehistoric lifeways in Clark County.

- *** Although new data for each phase has been accrued, such as the recently completed Bird Springs Test Excavations, there still remain many problems that call for more research. The data from the San Dieguito phase is in the same state as is that from the Tule Springs phase, and the same solutions and research opportunities apply to both.

- *** This expanded contract period of research should provide data on the possible hiatus period of 7,500 to 5,500 years B.P. No sites of this period are presently known. It is postulated that climatic conditions in the Great Basin created this hiatus, but not all areas were affected in the same ways. The finding and testing of deeply stratified rockshelter and open sites may

reveal deposits that span this hiatus period. Such testing should be coupled with the systematic collection and analysis of pollen and flotation samples. Such climatological data would help reconstruct the local paleoenvironments and test both the hiatus hypothesis and the ecological rationale behind the hiatus, if it really occurred.

*** Roasting pit sites present another opportunity for research. Although their function is suspected, additional pollen analysis and seed flotation and identification would help confirm this hypothesis. Since these features are quite abundant, radiocarbon dates from these are needed to establish their temporal affiliation. This program would contribute important data concerning prehistoric settlement/subsistence patterns and their possible change through time.

More detailed work concerning the Puebloan occupation of Clark County is needed. Despite the data currently available, much of this information was collected during the old "reservoir salvage" period of research and the sites are dated using ceramic cross-dating, not radiocarbon techniques. Tighter chronological controls are needed to establish a base for other lines of research. Other questions needing to be addressed include settlement/ subsistence patterns of the Pueblos through time, their social and political organizations, inter-group contacts via trade, and the reasons for the abandonment of Clark County by Puebloan peoples by 850 years B.P. Only further excavation can provide archeologists with the data necessary to deal with these questions.

This discussion gives only a general idea of certain shortcomings in currently available data and points out the need for continuing research into many aspects of Clark County prehistory.

Education

Both the Bureau of Land Management and the State of Nevada are involved in ongoing educational efforts within Clark County. BLM has placed interpretive signs along the Willow Springs Archeological Loop Trail, at the Wheeler Pass Charcoal Kilns, the Keyhole Canyon Petroglyph/Pictograph Site, in areas of the Red

*** Rock Canyon Recreation Lands, and other places. Further opportunities for placing interpretive protective signs could be developed on an "as identified" basis as these opportunities present themselves in the future. Priorities include rock art

sites, shelter caves, and historical sites with architectural features, which are being impacted by vandalism and illegal collection.

*** Other educational opportunities for BLM in Clark County involve more active efforts at public education. Educational brochures could be placed at all BLM offices, explaining the importance of cultural resources, why they should be protected, and the laws that enforce such protection. The District or Resource Area archeologists could also go into Clark County schools, and talk to civic organizations and other groups in order to explain these issues. This would involve a wider segment of the public than would the brochures, and perhaps help curtail vandalism and destruction of sites.

*** Construction of the Red Rock Canyon Visitor Center will provide another excellent opportunity to pursue public education. Interpretive displays dealing with the local and regional archeology within the larger context of southern Nevada prehistory can be established, and ranger talks and/or educational programs can be scheduled. Interpretive brochures on cultural resources could be available at the Center, and environmental education packages could be developed and made available to schools and other interested groups.

The State of Nevada's efforts include the Spring Mountain Ranch, a historic ranch currently listed on the National Register; the Museum of Natural History at UNLV; the Atlatl Rock Petroglyph Site and interpretive exhibits at the Visitor Center at Valley of Fire State Park; the Lost City Museum at Overton; and the Old Mormon Fort in Las Vegas. Additional exhibits of data from Clark County sites exist at the Nevada State Museum in Carson City. The Southern Nevada Museum in Henderson is the primary educational museum in the county.

Academic Uses

Archeological field classes from various institutions are held periodically in Clark County. The relatively abundant and untouched cultural resource base here provides an excellent opportunity to conduct courses in archeological field methods and techniques.

Protection

Protective measures completed in Clark County by BLM include protective fencing and positive protection signing of 16 selected archeological sites within the Red Rock Canyon Recreation Lands,

and limited excavations to recover data from badly vandalized sites, such as at Bird Springs. Preliminary test excavations have recently been completed at this site, under contract with a private consulting firm.

*** To further protect the resources of the county, more information is needed on the location and significance of the sites. More Class II and even Class III surveys are required so the necessary data needed to make management decisions concerning protective measures is available; for example, a Class II regional sampling inventory was completed in September within the Virgin Valley Planning Unit, because of the commercial interest in this part of the oil and gas Overthrust Belt. These surveys should sample a crosssection of environmental zones, to avoid bias and to provide a statistically acceptable inventory of the cultural resource with pertinent environmental and cultural data.

The data acquired through additional Class II sampling inventories will provide a better means by which to predict the environmental variables governing site type distribution within Clark County, and will enable archeologists to reconstruct cultural processes on a regional scale.

The "pothunters" who vandalize, destroy, and/or collect cultural resources for their own gain are a serious problem. Interpretive signing and protective fencing on an "as identified" basis would provide some protection. A program of regularly and irregularly scheduled patrols in sensitive areas or at particularly significant sites could serve as a partial deterrent to pothunters and help protect cultural resources. As a corollary to this patrol activity, BLM policy should be vigorous prosecution of apprehended vandals under the new Antiquity Act (Archeological Resources Protection Act of 1979). The publicity surrounding an active program such as this would help serve as a deterrent to further vandalism in some areas.

*** Nomination of sites or districts to the National Register of Historic Places (NRHP) presents an additional opportunity to protect cultural resources. The President's Advisory Council in consultation with the State Historic Preservation Officer and BLM must review any proposed surface-disturbing activities within NRHP districts or sites to ensure that these projects do not adversely affect the resources. In addition, properties listed on the NRHP are able to receive matching funds through BLM and the State Historic Preservation Office. Areas in Clark County that could be nominated include portions of the Red Rock Canyon Recreation Lands, Black Dog Mesa, and a series of significant sites within Hidden Valley in the South Muddy Mountains. Other sites and areas should be considered on an "as identified" basis.

*** Finally, controlled test excavations should be undertaken at badly pothunted, significant sites in order to recover as much of the remaining archeological information as possible, such as the Bird Spring Test Excavation. These sites include Brownstone Canyon, Willow Springs, Black Dog Mesa, Hidden Valley, and Whitney Pockets. Other sites should be added to this list as they are identified, and the excavation effort should be conducted as funds become available.

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.50 Ecological Profile

Overlays

One overlay has been prepared for each planning unit, showing areas which fall into the four quality rating classes.

Tabulations

Table .50-1 Major Bodies of Water in Clark County..... 11

Narrative

A. Ecological Setting

1. Biomes

Clark County is comprised primarily of the Mohave Desert Biome (hot desert). The Great Basin Desert Biome (salt desert) extends only into the northwestern corner of the Stateline Planning Unit.

The Mohave Desert Biome occurs in southwestern California, southern Nevada, and extreme western Arizona and is characterized by the presence of creosote bush (Larrea divaricata) and joshua tree (Yucca brevifolia).

The Great Basin Desert Biome occurs in most of Utah, southern Idaho, western Oregon, and all of Nevada except for the extreme southern portion of the state. It is characterized by the presence of big sagebrush (Artemisia tridentata) and saltbush (Atriplex spp.).

The boundary between these biomes is not a clear cut line but rather a band in which both mingle and grade into each other. The width of this band may be several miles wide.

Neither of these biomes is completely homogeneous although large expanses of big sagebrush or creosote bush may make it appear that this is so. Within both of these biomes there are a number of plant and animal communities that form the patchwork of the biome.

2. Communities

a. Creosote Bush

The creosote bush community is found throughout the county. It is typified by flat to slightly inclined topography covered sparsely by low desert shrubs. The elevation is usually under 4,100 feet.

There are many species of shrubs in this community. They include creosote bush (Larrea divaricata), burr sage (Franseria dumosa), range ratany (Krameria parvifolia), Mormon tea (Ephedra nevadensis), dalea (Dalea fremonti), Spanish bayonet (Yucca schidigera), joshua tree (Yucca brevifolia), turpentine broom (Thamnosma montana), purple sage (Salvia carnosa), spiny mendora (Mendora spinescens), and singlehead brittlebush (Encelia farinosa).

Forbs, grasses and other plants are much scarcer. Their density varies annually with precipitation. The major species of cacti include cholla and prickly pears (Opuntia spp.), barrel cactus (Ferocactus acanthodes). Major grass species include galleta (Hilaria jamesii), rough tobosa (Hilaria rigida), Indian ricegrass (Oryzopsis hymenoides), squirreltail (Sitanion hystrix), and dropseed (Sporobolus spp.). Leafy plants include buckwheat (Eriogonum spp.), asters (Aster spp.) and poppies (Eschsholtzia spp.).

A wide variety of wildlife exists in this community. Bats such as the California leaf-nosed bat (Macrotis californicus), Western pipistrelle (Pipistrellus hesperus) and the pallid bat (Antrozous pallidus) are common to abundant. Some rodents are also common: white-tailed antelope squirrel (Ammospermophilus leucurus), round-tailed ground squirrel (Citellus tereticaudus), Merriam and desert kangaroo rats (Dipodomys merriami and D. deserti), longtailed and little pocket mice (Perognathus formosus and P. longimembris), and cactus mouse (Peromyscus eremicus). The southern grasshopper mouse (Onychomys torridus) and desert woodrat (Neotoma lepida) are widespread but not numerous. Blacktailed jackrabbit (Lepus californicus) and desert cottontail rabbit (Sylvilagus audubonii) can be spotted throughout the area.

Carnivorous mammals that prowl through the creosote bush community include the coyote (Canis latrans), kit fox (Vulpes macrotis), badger (Taxidae taxus), and bobcat (Lynx rufus).

About 33 species of birds, of which nine are permanent residents, are found in the creosote bush community. The most common permanent residents are the Gambel's quail (Lophortyx gambelli), horned lark (Eremophila alpestris), raven (Corvus corax), cactus and rock wrens (Campylorhynchus brunneicapillus and Salpinctes absoletus), and LeConte's thrasher (Taxostoma lecontei).

Reptiles are numerous. Some of the lizards that inhabit this community are the side-blotched lizard (Uta stansburiana), Western whiptail (Cnemidophorus tigris), zebra-tailed lizard (Callisaurus draconoides), desert horned lizard (Phrynosoma platyrhinos), desert iguana (Dipsosaurus dorsalis) and desert spiny lizard (Sceloporus magister). Several species of snakes occur-speckled rattlesnake (Crotalus mitchelli), sidewinder (Crotalus cerastes), coachwhip (Masticophis flagellum), and glossy snake (Arizona elegans). Two protected species of reptiles present in the county are the gila monster (Heloderma suspectum) and the desert tortoise (Gopherus agassizi).

There has been no complete inventory of invertebrates in the area but it is known that numerous varieties of spiders, scorpions, and insects exist here.

b. Yucca/Creosote Bush

The yucca/creosote bush community is found throughout the county. It is typified by flat to slightly inclined topography covered sparsely by low desert shrubs. The elevation is usually less than 4,000 feet.

Many species of shrubs occur in this community. Joshua tree (Yucca brevifolia), banana yucca (Yucca baccata), and mohave yucca (Yucca schidigera) are the most prominent species, with an understory of most species found in the creosote bush community.

The same wildlife species found in the creosote bush community are found in the yucca/creosote bush community.

c. Blackbrush

The blackbrush community extends from about 4,000 feet in elevation to almost 6,000 feet. Closely-spaced, dark-colored, low desert shrubs are typical of this community.

Shrubs present here include blackbrush (Coleogyne ramosissima), joshua tree (Yucca brevifolia), banana yucca (Yucca baccata), ephedra (Ephedra spp.), hop sage (Grayia spinosa), bud sagebrush (Artemisia spinescens), as well as other species, like turpentine broom and saltbush. As in the creosote community, forbs and grasses are sparse here except during periods of unusually high rainfall. Some of the grasses and forbs present are buckwheat, dropseed, rough tobosa, Indian ricegrass, and red brome (Bromus rubens).

Most of the wildlife species present in the blackbrush community are the same ones that inhabit the creosote community. Some of these reptiles include the side-blotched lizard, western whiptail, desert spiny lizard, coachwhip, and speckled rattlesnake. The yucca night lizard (Xantusia vigilis), which is heavily dependent on the yucca plant, is abundant in the blackbrush community.

The raven, cactus wren, and rock wren are numerous here as they are in the creosote community. Both communities share the large number of birds that pass through the county during spring and fall migrations.

Common mammals include the California myotis, western pipistrelle, white-tailed antelope squirrel, long-tailed and little pocket mice, desert kangaroo rat, southern grasshopper, cactus, deer and canyon mice, desert woodrat, blacktail jackrabbit, desert cottontail, coyote, kit fox, bobcat, and badger. The bighorn sheep (Ovis canadensis nelsoni) occurs in the higher elevations of this community.

d. Greasewood/Shadscale

Where soils are strongly alkaline or saline, the sagebrush community is replaced by the greasewood-shadscale community. Typically, this community occurs around dry lakes and in valley bottoms where salts tend to accumulate in the soils. In Clark County, it is found only in the Stateline Planning Unit.

Besides greasewood (Sarcobatus vermiculatus) and shadscale (Atriplex confertifolia), green molly (Kochia americana), spiny hopsage (Grayia spinosa), four-wing saltbush (Atriplex canescens), winterfat (Eurotia lanata), quailbush (Atriplex lentiformis), saltbush (Atriplex polycarpa), (Suaeda torreyana), snakeweed (Gutierrezia sarothrae), bud sagebrush (Artemisia spinescens), arrowweed pluchea (Pluchea sericea), and horsebrush (Tetradymia axillaris) also occur in this community. The mesquites (Prosopis pubescens and Prosopis juliflora) may occur if subsurface water is available.

The commonest grasses are desert saltgrass (Distichlis stricta), hiliaria (Hilaria rigida), and fluffgrass (Tridens pulchellus). Few annual plants occur in this community. The commonest is desert mallow (Sphaeralcea ambigua).

As the concentration of salts in the soils increases, even these salt-tolerant plants such as pickleweed (Allenrolfea

occidentalis) may occur but eventually only a lake bed barren of all vegetation remains.

There are no animals that are restricted to this community. Members of surrounding communities occupy or use this community but are not present in large numbers.

e. Big Sagebrush

Clark County includes the southernmost portions of the Big Sagebrush desert of eastern Nevada. This desert stretches east, west, and north of the county and covers parts of Oregon, Washington, Idaho, and Utah, as well as most of Nevada. In all, about 90 million acres of land can be classified as being part of the Great Basin or Big Sagebrush desert.

This community is characterized by the presence of big sagebrush (Artemisia tridentata). Other plants commonly found include rabbitbrush (Chrysothamnus vicidiflorus), squirreltail (Sitanion hystrix), black sage (Artemisia nova), winterfat (Eurotia lanata), and spiny hopsage (Grayia spinosa).

Cacti include cholla (Opuntia spp.), prickly pear (Opuntia spp.), hedgehog (Echinocereus spp.) and pincushion (Mammillaria spp.).

Typical grasses include Indian ricegrass (Oryzopsis hymenoides), hiliaria (Hilaria spp.), and sand dropseed (Sporobolus cryptandrus).

Forbs include Russian thistle (Salsola kali), penstemon (Penstemon spp.), Indian paintbrush (Castilleja spp.) and broom snakeweed (Gutierrezia sarothrae).

In addition, there are representatives of the creosote bush community intermixed with the typical big sagebrush community representatives. This is due to the "blend-zone" of the two communities. The most obvious plants of the creosote bush community that are seen scattered within the big sagebrush community are creosote bush and yucca. The further north one goes, the fewer such atypical plants become until they disappear entirely.

The sagebrush desert shares many animals with the creosote bush desert, including the coyote, skunk, and badger, as well as numerous birds, rabbits, rodents, and reptiles. Mule deer use the sagebrush desert for winter range and wild horses use it yearlong.

Other mammals restricted to the sagebrush desert are the Great Basin pocket mouse (Peromyscus parvus) and Muttall's cottontail (Sylvilagus muttallii).

Birds that are indicative of the cold deserts are:

Poorwill (Phalaenoptilus nuttallii)
Common Nighthawk (Chordeiles minor)
Western Kingbird (Tyrannus verticalis)
Say's Phoebe (Sayornis saya)
Gray Flycatcher (Empidonax wrightii)
Horned Lark (Eumophila alpestris)
- Violet-green Swallow (Tachycineta thalassima)
Cliff Swallow (Petrochelidon pyrrhonota)
Black-billed Magpie (Pica pica)
Common Raven (Corvus corax)
Sage Thrasher (Oreoscoptes montanus)
Loggerhead Shrike (Lanius ludovicianus)
Green-tailed Towhee (Chlorura chlorura)
Vesper Sparrow (Spizella socialis)
Black-throated Sparrow (Amphispiza bilineata)
Sage Sparrow (Amphispiza belli)
Brewer's Sparrow (Spizella breweri)

Reptiles are fairly common in the sagebrush community. Some of the more characteristic reptiles include Great Basin rattlesnake (Crotalus viridis lutosus), sagebrush lizard (Sceloporus graciosus), and short-horned lizard (Phrynosoma douglassi).

The short-horned lizard is replaced by a closely related more southern form in Clark County, the desert horned lizard (Phrynosoma platyrhinos).

No complete inventory of invertebrates has ever been made, but it is known that numerous types of spiders, scorpions, and insects live in the sagebrush community.

f. Mountain Brush

The mountain brush community is found at mid-elevations, between the sagebrush and pinyon-juniper communities on the south and west-facing mountain slopes.

Many species of shrubs are found in this community. The more common plants are manzanita (Arctostaphylos pungens), shrub liveoak (Quercus gambelli), Ephedra species, cliffrose (Cowania stansburiana), skunkbush (Ribes trilobata), desert ceanothus (Ceanothus greggii), and mountain mahogany (Cercocarpus spp.)

Forbs and grasses are scarce.

The same wildlife species found in the sagebrush and pinyon-juniper communities are found in mountain brush communities.

g. Pinyon-Juniper

The pinyon-juniper community forms an open coniferous woodland from about 5,700 to 7,200 foot elevation. Topography varies from gentle rolling hills to steep mountain slopes, rocky canyons, and narrow ridges. The largest concentrations of pinyon-juniper woodland in the county are in the upper-mid elevations of the mountain ranges in the Stateline Planning Unit, and in small areas in the Virgin Mountains in the Virgin Valley Planning Unit.

Many species of shrubs and trees are present in this community. The more common ones include juniper (Juniperus osteosperma), pinyon pine (Pinus monophylla), banana yucca (Yucca baccata), cliffrose (Cowania stansburiana), squaw tea (Ephedra viridis), big sagebrush, Fremont barberry (Berberis fremontii), shadbush serviceberry (Amelanchier utahensis), currant (Ribes spp.), wild rose (Rosa woodsii), desert squawbush (Rhus trilobata), desert ceanothus (Ceanothus greggi), Gambel's oak (Quercus gambelli), oak brush (Q. turbinella), curllleaf mahogany (Cercocarpus ledifolius) and desert almond (Prunus fasciculata).

Forbs and grasses are scarce.

Reptiles also become rarer in this community. The sagebrush lizard and the western fence lizard (Sceloporus occidentalis) are the only two species which remain abundant. The speckled rattlesnake and Gilbert's skink (Eumeces gilberti) are present but are not common.

The red-tailed hawk (Buteo jamaicensis), common bushtit (Psaltiriparus minimus), western bluebird (Sialia mexicana) and rock wren are permanent residents in this community. Summer visitors include the turkey vulture (Cathartes aura), nighthawk (Chordeiles minor), white-throated swift (Aeronautes saxatalis), broadtailed hummingbird (Selasphorus platycercus), ash-throated flycatcher (Myiarchus cinerascens), scrub jay (Aphelocoma coerulescens), black-throated gray warbler (Dendroica nigrescens), Scott's oriole (Icterus parisorum), rufus-sided towhee (Pipilo erythrophthalmus), and chipping sparrow (Spizella passerina).

The canyon and deer mice and the desert woodrat which occur at lower elevations are also present in this community. The rock squirrel (Citellus variegatus) and pinyon mouse (Peromyscus maniculatus) are more common here than they are elsewhere. The Great Basin pocket mouse (Perognathus parvus), is restricted to this community. The larger carnivores - bobcat, coyote, and gray fox (Urocyon cinereoargenteus) - frequent this community. In addition to bighorn sheep, mule deer (Odocoileus hemionus) appear but are scarce within the county.

h. Fir/Pine

The fir/pine community also forms open coniferous forests, but is much rarer in the county than the pinyon-juniper community. It ranges from about 7,200 to 9,000 feet. A few isolated regions occur in the Virgin Mountains of the Virgin Valley Planning Unit, and in the Spring Mountains of the Stateline Planning Unit.

Some of the trees present in the fir/pine forests are ponderosa pine (Pinus ponderosa), white fir (Abies concolor), quaking aspen (Populus tremuloides), Gambel's oak (Quercus gambelli), and scattered pinyon pine and Utah juniper. Also available are shrubs like currant (Ribes spp.), ocean spray (Holodiscus microphyllus), and shadbush serviceberry (Amelanchier utahensis).

Reptiles are rare at this elevation; the only common species is the sagebrush lizard. The western skink (Eumeces skiltonianus) and the western fence lizard (Sceloporus occidentalis) may be present but are not common.

There are only a few permanent resident birds in the fir-pine community. The golden eagle (Aquila chrysaetos), Clark's nutcracker (Nucifraga columbiana), whitebreasted and pygmy nuthatches (Sitta carolinensis and S. pygmaea), canyon wren (Catherpes mexicanus), Cassin's finch (Carpodacus cassinii), and common bushtit (Psaltiriparus minimus) live in this community year-round. But nonresident birds comprise the bulk of the fir/pine community's avifauna. The most important summer residents include the red-tailed hawk, white-throated swift, broadtailed hummingbird, and chipping sparrow (all of which are also present in the pinyon-juniper community) as well as the red-shafted flicker (Colaptes cafer), hairy woodpecker (Dendrocopos villosus), western bluebird (Sialia mexicana), Audubon's warbler (Dendroica auduboni), and western tanager (Piranga ludoviciana).

Mammals are very prominent members of this ecosystem. Some of the bat species present are the long-eared and long-legged myotis bats (Myotis evotis and M. volans) and the big brown bat (Eptesicus fuscus). Rodents are very abundant here. The golden-mantled ground squirrel and rock squirrel (Citellus lateralis and C. variegatus), the bushytailed and desert woodrats (Neotoma cinera and N. lepida), the porcupine (Erethizon dorsatum), and the deer, canyon and pinyon mice (Peromyscus maniculatus, P. crinitis and P. truei) are all permanent residents in the fir-pine community. They are preyed upon by the usual predators - bobcats, coyotes, and foxes. Bighorn sheep and mule deer are also present in this community but are not as numerous here as they are at lower elevations.

i. Bristlecone Pine

The bristlecone pine community is an open coniferous forest area above 9,000 feet elevation. The only identified patches of bristlecone pine in the county are in the Spring Mountains (Mt. Potosi and Charleston Peak) in the Stateline Planning Unit.

The species of trees which dominate this community are the bristlecone pine itself (Pinus aristata), limber pine (Pinus flexilis), white fir (Abies concolor), and common juniper (Juniperus communis). Understory shrubs and herbaceous vegetation are almost absent.

Wildlife is also scarce at this high elevation. There are no reptiles or amphibians present. The same bats and birds that inhabit the fir/pine community exist in the bristlecone pine community, but there are fewer nonresident birds at the higher elevations. Rodents, which were so abundant in the fir/pine community are very uncommon among the bristlecones. The deer mouse is the only common rodent here. Mule deer may be found in this community but are not common here.

j. Desert and Stream Riparian

The riparian community is found around streams, springs, and along washes from the lowest elevations of the creosote bush community to the fir/pine community.

Vegetation is very abundant in this moist community. Just a sample of the species present includes cottonwood (Populus fremonti), mesquite (Prosopis juliflora and P. pubescens), wild rose (Rosa spp.), salt cedar (Tamarix gallica), willow (Salix spp.), reeds (Phragmit spp.), catclaw (Acacia

gregii), sedges (Carex scirpus), rushes (Juncus spp.), common cattail (Typha latifolia), white burrobrush (Hymenoclea salsola), snake weed (Gutierrezia spp.), and bladder sage (Salazaria mexicana).

Wildlife is also abundant this close to scarce supplies of water. Amphibians like the tree frog (Hyla regilla), red-spotted toad (Bufo punctatus) and the bullfrog are restricted to the riparian and aquatic communities. Some of the most common reptiles in the riparian community are the desert horned lizard (Phrynosoma platyrhinos), zebra-tailed lizard, desert iguana (Dipsosaurus dorsalis), leopard lizard (Crotaphytus wislizeni) and sidewinder (Crotalus cerastes).

Innumerable species of birds take advantage of the abundant cover and forage available in the riparian community.

Many of the same mammals that frequent the creosote, blackbrush, pinyon-juniper, and fir-pine communities utilize the riparian community. Some of the common ones include the pocket, deer and canyon mice, the desert woodrat, kangaroo rat, bobcat and coyote. The ring-tailed cat (Bassariscus astutus), racoon (Procyon lotor), and striped and spotted skunks (Spilogale gracilis and Mephitis mephitis) seem to prefer the riparian community to others.

k. Aquatic

The aquatic community in the county is made up of streams, springs, ponds, and lakes. Table .50-1 lists the major bodies of water in the county.

There are many springs scattered throughout the county. Warm Springs, on private land in the Virgin Valley Planning Unit, is thermal in nature. Willow Creek is the only stream of consequence on BLM administered lands in the Stateline Planning Unit.

Some vegetation species like sedges, rushes, and cattails which are present in the riparian community are also present in the aquatic community. Other aquatic plants include the following species: Chara, Nasturtium, Potamogeton, and Ruppia. Algae, diatoms and other plants are also important aquatic vegetation.

A wide variety of animals inhabit the aquatic community. Invertebrates include snails, crustaceans and aquatic insects. They are preyed upon by amphibians like the bullfrog (Rana catesbeiana), the Pacific treefrog (Hyla regilla) and red-spotted toad (Bufo punctatus). Waterfowl

(ducks and geese) utilize the aquatic habitat in the Virgin Valley Planning Unit as resting and feeding stops during spring and fall migrations. Shorebirds like the killdeer (Charadrius vociferus) and the American avocet (Recurvirostra americana) are more permanent residents.

Fish, of course, are the dominant animal member of this community, the most common species include the black bull head catfish (Ictalurus melas), mosquito fish (Gambusia affinis), carp (Cyprinus carpio), largemouth bass (Micropterus salmoides), and bluegill sunfish (Lepomis macrochirus). Small fish, such as trout, inhabit Willow Creek. A few of the species of fish present in the Virgin River in the Virgin Valley Planning Unit are scarce and are protected by state or federal laws. These are the Moapa dace (Moapa coriacea) and the woundfin (Plagopterus argenteus). Exotic fish like mollies, guppies, and swordtails may be found in some of the scattered thermal springs where people have released them.

TABLE .50-1
Clark County

MAJOR BODIES OF WATER IN CLARK COUNTY*

<u>Aquatic Community</u>	<u>Location</u>	<u>Length or Surface Area</u>
Muddy River	T.14S., & 15S., R.63 to 68E.	40 miles
Virgin River	T.13S to 14S, R.68 to 71E.	18 miles
Bowman Reservoir	T.15S, R.67E	165 acres

* on BLM administered lands. Also see Section .35, Water Resources.

B. Ecological Quality

1. Analysis

a. Non-living Components

For a thorough discussion of non-living components in Clark County refer to the following sections of the URA:

Air - See .31 Climate

Land - See .32 Topography, .33 Geology and Soils, .38 Limiting Physical Factors, .41 Lands, .45 Watershed, .47 Recreation

Water - See .35 Water Resources

b. Living Components

For a thorough discussion of living components in Clark County refer to the following sections of the URA:

Plants - See .34 Vegetation, .43 Forest Products, .44 Range Management, .46 Wildlife Habitat, .47 Recreation

Animals - See .36 Animals, .46 Wildlife Habitat

2. Quality Ratings

The county contains areas of four quality classes: unique (Class I), fragile (Class II), substandard (Class III), and standard (Class IV). The following narrative describes the classes and lists some areas within each class.

Unique Quality Areas (Class I): These are areas which are locally unique due to floral/faunal community composition, geographic or altitudinal location of flora and/or fauna, hydrologic features, and ecological interrelationships. Unique quality areas are identified on the Ecological Profile Overlays with numbers I-1 through I-13. The following list is a summarization of the values found in each area. For complete discussions on these unique quality areas, consult the Critical Environmental Area Analysis portion of the Planning Area Analysis.

Virgin Valley Planning Unit

I-1: Virgin Mountain Natural Area - unusual Nevada occurrences of Arizona cypress and Douglas fir, high scenic values.

- I-2: Whitney Pockets - important archeological values.
- I-3: Black Dog Mesa - important archeological values.
- I-4: Arrow Canyon - valuable geologic sightseeing area, important archeological values.
- I-5: Hidden Valley/Colorock Quarry - outstanding scenic values, archeological sites, botanical values.
- I-6: Buffington Pockets - high archeological values, Chevron Oil Co. is planning a test well for oil exploration purposes.

Stateline Planning Unit

- I-7: Frenchman Mountain/Rainbow Gardens - contains outstanding scenic geology and high botanical values.
- I-8: Cold Creek/Willow Creek/Wheeler Wash Area - contains perennial streams and high recreation values.
- I-9: Red Rock Canyon Recreation Lands - contains high scenic values, recreation opportunities, interesting geologic formations, diverse vegetation and wildlife, and high archeological values.
- I-10: Wheeler Pass Charcoal Kilns - cultural resources site of National Register quality.
- I-11: Keyhole Canyon Rock Art Site - important petroglyph/pictograph site.
- I-12: Teddybear Cholla Stands - these stands mark the northernmost extension of the species.
- I-13: Las Vegas Dunes Off-Road Vehicle Play Area - sand dune area where ORV activity is popular.

Fragile Quality Areas (Class II): This class includes areas which are highly sensitive to the effects of change agents in the environment and are, therefore, in a fragile condition. Fragile quality areas are identified on the

Ecological Profile Overlays and include the following types of areas:

- 1) Crucial wildlife habitat areas for desert tortoise, bighorn sheep, and Gambel's quail.
- 2) "Severe" SSF (81-100) watershed rating areas.
- 3) Areas averaging 8 inches or less of precipitation annually, with the exception of playas. Playas are not deemed to be subject to change agents and are, therefore, not fragile environments.

Eight inches or less of annual precipitation is a critical limiting factor in the Mohave Desert Biome environment. If vegetation is destroyed due to human activity or fire, natural revegetation in these extremely low precipitation areas is a difficult and slow process. Many of the lower elevation areas of Clark County are therefore in fragile condition (i.e., greatly sensitive to human activity or natural change agents). Class II areas delineated on the overlays are not listed here because so much acreage is involved.

Substandard Quality Areas (Class III): This class is composed of areas which present an appearance of unhealthy ecosystems in which the ecological interrelationships are dysfunctioning. These areas are not in a fragile condition (with the two exceptions of the recent man-caused burn areas and the substandard public lands in the metropolitan Las Vegas area). The following types of substandard areas are on the Ecological Profile Overlays.

- 1) Areas having a "critical" SSF (61-80) rating that are not in a fragile quality area (i.e., those "critical" SSFs in zones above 8 inches annual precipitation or outside wildlife crucial areas).
- 2) Some recent man-caused burn areas (areas which may repeatedly be subject to fires).
- 3) Public lands within the Las Vegas metropolitan area (including Sunrise Mountain Natural Area) in the Stateline Planning Unit, that are substandard with respect to their potential highest and best uses and with respect to uses of adjacent developed lands. An appropriate use for these lands would be residential, commercial, or industrial development. These lands could also be used for urban "green belt" purposes.

As Las Vegas expands, new fringe areas will become substandard due to use pressures and will require additional management attention.

II/III-1: Sunrise Mountain Natural Area - this area was designated a Natural Area in 1970 but no longer meets those criteria.

- 4) Public lands in the Spring Mountains: these lands fall into Class III because of heavy human use pressures and the abuses which have resulted. Continued use is expected and the living elements of the biome could be subjected to greater degradation.

Standard Quality Areas (Class IV): These are areas with no major problems in community functioning. These remaining areas also are delineated on the Ecological Profile Overlays.

- 1) Playas - these areas are functioning in their standard ecological capacity.

- 2) The remainder of the county - those areas not deemed as Class I, II, or III.

3. Trend

Virgin Valley Planning Unit

The Virgin Valley Planning Unit has had no study programs established within it. Therefore, it is not possible to accurately predict trend within the planning unit for any resource values.

Visual observation methods during the Range Survey were used to establish apparent condition and trend values for the range forage resource. The percentages of area in each apparent condition and trend class are as follows (refer to the Forage Condition and Trend Overlay for locations):

<u>Condition</u>	<u>Percent of Total</u>
Good	3%
Fair	6%
Poor	91%
<u>Trend</u>	<u>Percent of Total</u>
Improving	2%
Stable	95%
Regressing	3%

The results show that 91% of the planning unit is in poor forage condition and that 95% of the planning unit has an apparent trend of "stable." This static trend is attributable, in large part, to low precipitation and high summer temperatures which affect the composition, density, and vigor of plant species.

Human use pressures (such as firewood sales, camping and hiking in wildlife habitats and near water sources, and ORV use) are growing steadily in Clark County, a reflection of high population growth and the energy crisis which induces residents to recreate close to home. Therefore, a regressing trend may be expected to occur in the planning unit in the long-term when all resource values are considered.

Stateline Planning Unit

The Stateline Planning Unit has had no study programs established within it, with the exception of the study plots in the Crescent Peak allotment which gauge the trend of the forage resource only. Therefore, it is not possible to accurately predict trend within the planning unit for any resource values.

The study plots in Crescent Peak allotment show a stable (or static) trend for the range forage resource.

Visual observation methods during the Range Survey were used to establish apparent condition and trend values planning unit - wide for the forage resource. The percentages of area in each apparent condition and trend class are as follows (refer to the Forage Condition and Trend Overlay for locations):

<u>Condition</u>	<u>Percent of Total</u>
Good	3%
Fair	11%
Poor	86%

<u>Trend</u>	<u>Percent of Total</u>
Improving	2%
Stable	94%
Regressing	4%

The results show that 86% of the planning unit is in poor forage condition and that 94% of the planning unit has an apparent trend of "stable." This static trend is attributable, in large part, to low precipitation and high summer temperatures which affect the composition, density, and vigor of plant species.

Human use pressures (such as firewood sales, camping and hiking in wildlife habitats and near water sources, and ORV use) are growing steadily in Clark County, a reflection of high population growth and the energy crisis which induces residents to recreate close to home. Therefore, a regressing trend may be expected to occur planning unit-wide in the long-term when all resource values are considered.

C. Management Opportunities

1. Enhancement or Improvement

Virgin Valley Planning Unit

The condition of several unique and/or fragile quality areas can be improved by either reducing adverse change agents or introducing beneficial ones. These areas and methods of enhancing their quality are described below.

- a. "Severe" SSF (81-100) Watershed Rating Areas (fragile):
For any actions permitted in these areas, require enhancement measures (over and above mitigating measures) to improve the SSF rating in the area to be utilized. For locations of SSF watershed rating areas, refer to the Watershed Management Opportunities Overlay.

- b. Whitney Pockets (I-2):

Significance - important archeological and scenic values (which incorporate dramatic topographic elements and red and white sandstone outcroppings).

Adverse change agents - visitor use pressures.

Possible modifications by resource activities - develop day use and overnight recreation facilities, including interpretive trails, and site those facilities in non-sensitive archeological areas; increase patrols in area.

Potential status change - from unique, fragile, and regressing, to unique, fragile, and stable.

Stateline Planning Unit

The condition of several unique and/or fragile areas can be improved by either reducing adverse change agents or introducing beneficial ones. These areas and methods of enhancing their quality are described below.

- a. "Severe" SSF(81-100) Watershed Rating Areas (fragile):
For any actions permitted in these areas, require enhancement measures (over and above mitigating measures) to improve the SSF rating in the area to be utilized. For locations of SSF watershed rating areas, refer to the Watershed Management Opportunities Overlay.

b. Cold Creek/Willow Creek/Wheeler Wash Area (I-8):

Significance - area with high local recreation use pressures due to unique aquatic and other biotic resources not found elsewhere in Clark County.

Adverse change agents - indiscriminate recreation use pressures with low regard to resource values; development of private property adjacent to Cold Creek.

Possible modifications by resource activities - Willow Creek: through proper design techniques, relocate those recreational activities incompatible with the resource values. Specifically, this may include relocating camping away from the stream, restricting picnicking to designated areas, and construction of interpretive trails. Cold Creek: limited enhancement activities, such as development of interpretive trails and picnic facilities. Wheeler Wash Area: upgrade access roads into area.

Potential status change - from unique, substandard, and regressing, to unique, standard, and improving.

c. Red Rock Canyon Recreation Lands (I-9):

Significance - contains high scenic values, recreational opportunities, interesting geologic formations, diverse vegetation and wildlife, and high archeological values.

Adverse change agents - unconstrained and indiscriminate recreation use pressures, potential oil and gas exploration and development activities, wildfires.

Possible modifications by resource activities - close and rehabilitate roads not required for recreational access; functional design of recreation sites responsive to resource values at the sites; develop interpretive and hiking trails; adhere to all the recommended mitigating measures within the Environmental Assessment of Oil and Gas Leasing in the Red Rock Canyon Recreation Lands of 1980; utilize pre-attack planning and initial attack wildfire procedures as developed by the District Fire Management Officer.

Potential status change - from unique, substandard, and regressing, to unique, standard, and improving.

d. Las Vegas Dunes Off-Road Vehicle Play Area (I-13):

Significance - highly significant ORV play area and fragile soil area.

Adverse change agents - ORV activity.

Possible modifications by resource activities - in cooperation with local ORV users, design and construct recreational facilities compatible with ORV use, which may include identification of courses for specific ORV activities (dune buggies, dirt-bikes, etc.) and construction of day-use facilities. Fragile watershed status needs reconsideration.

Potential status change - from unique, fragile, and regressing, to unique, fragile, and stable to improving (with regard to the trend on the value of the recreation experience).

2. Protection or Maintenance of Present Conditions

Virgin Valley Planning Unit

Other unique or fragile quality areas need various types of protection to maintain their present conditions. However, long-term protection of these areas may require some forms of enhancement as use pressures increase.

a. Crucial Wildlife Habitat Areas:

Identify change agents; assure that no degradation to habitat quality or quantity is caused by those agents by mitigating as thoroughly as possible any potential impacts of an action, or by denying or altering an action if mitigation is not possible.

b. Virgin Mountain Natural Area (I-1):

Significance - this is one of the most remote areas in Clark County and contains a unique combination of flora and fauna and high scenic values (rugged topographic features).

Adverse change agents - potential mining activity as indicated by mining occurring in adjacent areas; intrusion of BLM range improvements many years ago; wildfires.

Possible modifications by resource activities - prohibit future land uses which would detract from the natural character of the landscape; emphasize fire management practices.

Potential status change - from unique, standard, and stable, to unique, standard, and stable.

c. Black Dog Mesa (I-3):

Significance - highly significant archeological site that is worthy of being nominated to the National Register of Historic Places.

Adverse change agents - utility corridor pressures.

Possible modifications by resource activities - encourage retrieval of the archeological values through scientific methodologies which may include artifact excavation if other mitigating measures are not feasible.

Potential status change - from unique, fragile, and stable, to unique, fragile, and stable.

d. Arrow Canyon (I-4):

Significance - important archeological values, high scenic values due to geologic structure.

Adverse change agents - ORV use, indiscriminate defacing of the canyon walls by various groups (such as by educational institution field classes).

Possible modifications by resource activities - limit access when vandalism of a site warrants such measures; increase patrols of the area; remove existing graffiti where possible; install appropriate interpretive signs.

Potential status change - from unique, fragile, and regressing, to unique, fragile, and stable.

e. Hidden Valley/Colorock Quarry (I-5):

Significance - outstanding scenic and botanical values and archeological sites.

Adverse change agents - potential oil and gas exploration and development activities, increasing ORV use pressures, wildfires, mining activities.

Possible modifications by resource activities - limit oil and gas activities within the subject area; limit access to the Hidden Valley portion of the area; emphasize fire management procedures; emphasize enforcement of the 3809 surface protection regulations; retrieve archeological information, as needed, to protect from incompatible land uses.

Potential status change - from unique, fragile, substandard, and regressing, to unique, fragile, and stable.

f. Buffington Pockets (I-6):

Significance - high scenic and archeological values; oil and gas exploration activity is planned.

Adverse change agents - potential oil and gas exploration and development activities, increasing ORV use pressures, some mining interest.

Possible modifications by resource activities - limit oil and gas activities within subject area; limit ORV use to existing roads and trails; retrieval of archeological values as area is encroached on by incompatible land uses.

Potential status change - from unique, fragile, and regressing, to unique, fragile, and stable.

Stateline Planning Unit

Other unique or fragile areas need various types of protection to maintain their present conditions. However, long-term protection of these areas may require some forms of enhancement as use pressures increase.

a. Crucial Wildlife Habitat Areas:

Identify change agents; assure that no degradation to habitat quality or quantity is caused by those agents by mitigating as thoroughly as possible any potential impacts of an action, or by denying or altering an action if mitigation is not possible.

b. Frenchman Mountain/Rainbow Gardens (I-7):

Significance - contains outstanding geologic structure and interesting botanical values; Frenchman Mountain is

currently used as a communication site; utility projects may intrude into the area.

Adverse change agents - communication site uses, indiscriminate dumping, mining activities within Rainbow Gardens, authorized sanitary landfill on south side of Frenchman Mountain, encroachment of large utility corridors.

Possible modifications by resource activities - clean up indiscriminate dumping sites; locate some utility projects in areas outside of the subject area; as applicable, emphasize enforcement of the 3809 surface protection regulations.

Potential status change - from unique, fragile, and regressing, to unique, fragile, and stable.

c. Wheeler Pass Charcoal Kilns (I-10):

Significance - cultural resources site of National Register quality.

Adverse change agents - visitor use pressures and some associated vandalism; natural deterioration of kilns.

Possible modifications by resource activities - develop adequate interpretation plan; increase patrols of the area; and increase stabilization efforts.

Potential status change - from unique, substandard, and regressing, to unique, substandard-to-standard, and stable.

d. Keyhole Canyon Rock Art Site (I-11):

Significance - important petroglyph/pictograph site, scenic values.

Adverse change agents - visitor use pressures and some associated vandalism of rock art.

Possible modifications by resource activities - develop day use facilities at the entrance to the canyon; limit vehicular access; increase patrols of area.

Potential status change - from unique, fragile, and regressing, to unique, fragile, and stable.

e. Teddybear Cholla Stands (I-12):

Significance - the northern-most extension of the cactus species.

Adverse change agents - ORV use pressures.

Possible modifications by resource activities - limit ORV use within this small area.

Potential status change - from unique, fragile, and stable, to unique, fragile, and stable.

f. Sunrise Mountain Natural Area (II/III-1):

Significance - formerly the area was of high scenic quality due to its interesting landforms and colorful geology. Now the area is substandard because of public recreational and urban uses incompatible with its Natural Area status which has resulted in degradation relative to this status. However, the area retains urban/regional park values.

Adverse change agents - visitor use pressures.

Possible modifications by resource activities - management of the area as as Natural Area is no longer possible because of heavy use pressures. Therefore, the area should be undesignated and considered for recreational development as part of an urban/regional park.

Potential status change - from fragile, substandard, and regressing, to fragile, standard, and stable.

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